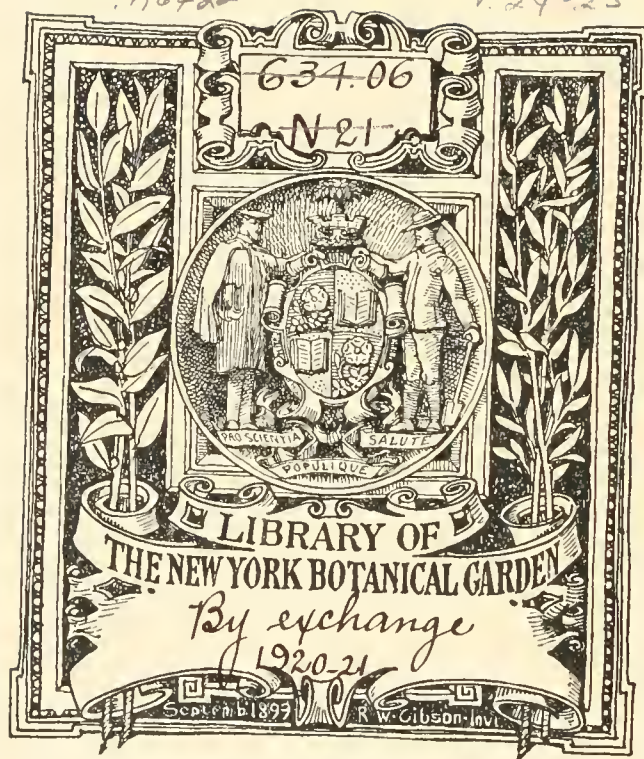


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(OF AMERICA)

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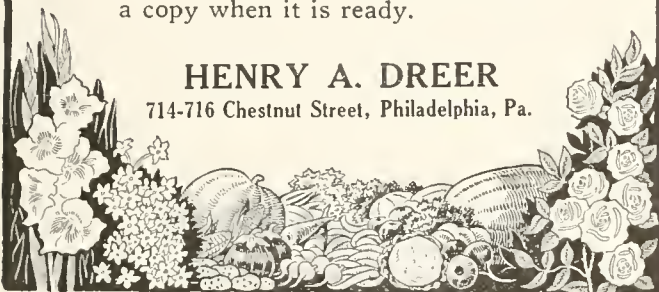
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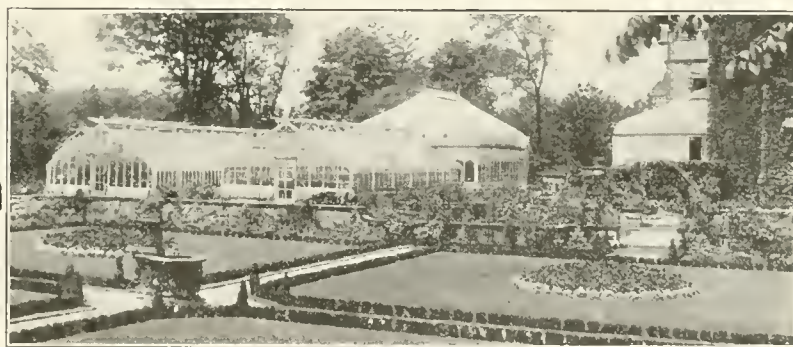
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

JANUARY, 1920

No. 1

Things and Thoughts of the Garden

THE ONLOOKER

"Gardening is the purest of human pleasures, the greatest refreshment to the spirit of man."

—Francis Bacon.

THESE words, written some three hundred years ago, should be emblazoned all over the land to-day, for never perhaps in the history of the world has there been such seeking after pleasure as now, nor has the spirit of men ever been in greater need of refreshment. For a long period of time gardening has been the study and recreation of men in all stations of life. To many it has been a life-work of absorbing interest, and to-day it still offers a satisfying charm not exceeded by any other occupation. Countless busy people seeking bodily recreation and mental relaxation have found in it a fascinating and delightful hobby, in the pursuit of which business cares have been stripped of their baneful influence and at the same time the spirit of youth has been renewed once more. Of late years especially, many agencies have been actively at work in the development of the home garden movement, lectures, demonstrators, magazines and catalogs, all are helping to "Make America Beautiful." The advantages of nature study and school gardening are being more widely recognized by those responsible for the up-bringing of the rising generation, and there is no doubt of their being potent factors in the development of good citizens. Yes, indeed, there is much to be said in favor of gardening, whether followed as a profession or taken up for purely sentimental or recreational reasons, and a widespread love for the pleasure and beauties of a garden would undoubtedly create a more general feeling of contentment and happiness, of which there is great need in the world to-day.

* * *

Nearly everybody has an innate feeling of regard for plants and flowers which oftentimes struggles to express itself under adverse conditions, as we may see here and there in the windows of a crowded tenement district. How those people whose little gardens are limited by the size of the window space must envy those who can go out on the ground and dig and plant and cultivate a real garden. No matter if it is but a few square feet in extent, it may still be one of the very best of gardens because of the pleasure it gives the owner and the personality it expresses. The best Rose garden I know of is not the biggest by any means, nor yet the best designed, but the best because of the true spirit of gardening which it portrays. The owner, an active business man, living in the suburbs of a thriving industrial city, has in his leisure

hours literally surrounded his home with beautiful Roses. Starting with just a few plants, his enthusiasm was aroused, and year by year new beds were made, and really made the natural gravelly soil being removed to a depth of three feet and replaced with loam and cow manure. To-day practically every available foot of space is devoted to Roses, some thirty or forty varieties in separate beds of two to three dozen plants, while even more varieties than that are represented by just one or two plants in a trial bed to which new kinds are added every year. It is a genuine delight to visit that garden and spend an hour with this enthusiastic rosarian, and it is his pleasure to welcome visitors and freely impart of his knowledge and experiences. The influence of that garden has shown itself in and beyond the immediate neighborhood and our friend might well be regarded as a first-class demonstrator.

* * *

Something of that kind has happened many times, for when the gardening fever gets well started the amateur gardener may very likely develop into a keen and enthusiastic specialist with some one particular genus or family. Roses, Sweet Peas, Gladioli, Peonies and Dahlias are examples of popular flowers especially beloved by amateur gardeners amongst which are to be found some of the most successful cultivators. As a matter of fact, our gardens have been enriched in large measure as a result of the labors of unprofessional gardeners, many of whom have made for themselves an enviable record in the matter of originating new varieties by hybridising and selection, as a critical study of the development of some of the races of garden plants will show. One of the good points of gardening is the wide range of subjects from which one may make a choice for specialization if so inclined—plants to suit any individual taste, as we find expressed in this quaint old saying—

"Different people has different opinions

Some likes horchids and some likes hinions."

To speak of these two in the same breath might not be considered good taste in some society, but a good deal of wealth in this locality has been made by specializing in the pungent onion and so making it possible for some to gratify their desire for the aristocratic orchid.

The work of originating and developing new plant varieties makes a strong appeal to the imagination even though the chances favor the drawing of more blanks than prizes. In spite of all that has been done there is a

wide field to work in yet and open to all comers. Some amateurs could better give time and attention to this than the majority of their professional brethren. What has been accomplished in the past should be but a stimulus to take up this fascinating work, especially as the scientific principles of plant-breeding are now more widely known.

* * *

Orchids have a great fascination for most people and are quite commonly regarded with a kind of mysterious awe, induced perhaps by thrilling stories of the experiences of some orchid collectors as well as by the large sums of money that have been paid for certain varieties. There are many notable collections in this country and abroad and whenever orchids are placed on public exhibition they are sure to attract a good deal of attention. Many of the species require the attention of expert growers, but there is at least one that may be grown to perfection by anyone having a greenhouse, and that is the well-known Lady's Slipper, *Cypripedium insigne*. Grown in a mixture of fibrous peat, lumps of turfy loam, sphagnum moss and charcoal, in well drained pots so that the abundance of water required at all times may not stagnate, it is as easy to grow as a geranium and will reward with a good crop of flowers around the Christmas season, which in a cool house remain fresh for many weeks. It is just a hundred years ago since this useful plant was introduced into English gardens from India, and during that time it has given rise to numerous varieties. One of the best is the lovely pale yellow and white *Sanderæ* which never fails to excite the admiration of all who see it. It appeared as a chance plant amongst a lot of newly-imported *C. insigne* in the famous Sander nursery at St. Albans, England, about thirty years ago. It proved to be a lucky find for in the first few years of its division several pieces were sold for one hundred guineas apiece.

* * *

Some of our friends go south for the winter and write back of green growing things, but we don't envy them so much if we have a greenhouse in which we can spend some of the time when the thermometer is flirting with zero. When there is only a pane of glass separating arctic weather from tropical plants that is the time we appreciate a greenhouse most of all. As time goes on we shall expect to see more people wanting a small greenhouse to make their garden more complete, so that they may continue their gardening activities the year round. A great deal of pleasure can be obtained in this way at moderate cost. There are a number of plants from which to choose that grow and flower well in a house with a night temperature of about 55° F. and in the case of a conservatory attached to the residence it is often possible to heat it from the house system with little extra expense. A greenhouse may become a very personal thing where the owner can enjoy intimate association with a few favorite plants. A friend of mine had such a one as a hobby and filled it mostly with orchids, of kinds not too exacting in their requirements. They were the joy of his life and a source of pleasure to his friends and neighbors. These little glass structures are useful in many ways. Plants for the flower garden can be carried over or raised from seed in good season, also early vegetable plants. Rhubarb and chicory can be forced under the benches for use in early spring, while later on a crop of melons or tomatoes can be grown to maturity, so that it need never remain empty.

* * *

Good light is a most important factor in the growing of flowering plants in the greenhouse at this time of

year, and the location of a greenhouse should always be carefully determined with this fact in mind. One can always shade against the sunshine if necessary, but you can't get all the desired sunshine in if the house is wrongly placed. Under the best of conditions a continued spell of dull weather makes a noticeable difference in the production of flowers. But in this respect we are much more fortunate than our English brethren, who labor under the disadvantage of gray skies most of the time from November till March. Visitors from overseas are greatly impressed with the wealth of cut flowers we have here in the winter months, and are especially enthusiastic over the fine Roses and Carnations. In the neighborhood of London especially, the grower of winter-flowering plants is greatly handicapped by the poor daylight, while once in a while a thick, penetrating, evil-smelling fog envelopes everything, making matters still worse. The poisonous gases of a genuine London fog have a very injurious effect on some greenhouse plants, Begonias in particular being very sensitive. Their flowers wither and fall off, frequently the buds as well, and many a bright display has been shorn of its glory over night.

* * *

The Begonia ranks as one of the most important of the ornamental plants and anyone wishing to specialize with one particular genus could get a lot of pleasure in gathering together a representative collection from amongst the hundreds of species and varieties. One of the most noteworthy of the species is *Begonia socotrana*, introduced into British gardens from the island of Socotra by Professor Balfour of Edinburgh Botanic Garden in 1880. It is a very distinct species, as would be expected from its natural environment, its chief distinguishing character being the cluster of bulbils at the base of the stem by which means this species is propagated annually. As a winter flowering plant it is well worth growing for its own beauty, but it is as a parent of the beautiful winter-flowering hybrids that it is most famous. Previous to its introduction, growers had had visions of a new and wonderful race if only a cross could be effected between the shrubby section and the large handsome flowered tuberous-rooted section, but all attempts to bring this about had failed until it began to be regarded as an impossibility. But five years after the introduction of *B. socotrana* the first of the new race of hybrids was distributed, the variety John Heal, named for the famous plantsman with James Veitch & Sons, of London, who made the cross between *socotrana* and a tuberous-rooted variety. Thus was originated that new race that had long been dreamed of, and as the years went by John Heal followed up his initial success with many other fine kinds, both singles and doubles. In more recent years Messrs. Clibran of Altrincham, England, have raised some very choice double varieties, adding to the range of colors.

It is interesting to note that these varieties are becoming more widely known on this side of the Atlantic and one may count them a decided acquisition to the list of choice greenhouse plants. They are propagated by stem and leaf cuttings and so far as known none of this new race have yet produced seed.

In 1891 Lemoine crossed *B. socotrana* with *B. Dregii* and obtained the popular variety Gloire de Loraine, of which there are now several improved forms. Another fine Begonia, also an offspring of *B. socotrana* is Gloire de Seeaux. This is a particularly handsome plant with its large bronzy leaves and soft pink flowers and well grown specimens five to six feet high, are something to be remembered.

Landscape Possibilities with Brook and Natural Stream

RICHARD ROTHE

*River, River, little River!
Bright you sparkle on your way;
O'er the yellow pebbles dancing,
Through the flowers and foliage glancing;
Like a child at play.*

For the above sketch-like, but vivid image of a clear natural stream of water, as we may see it, coming down on its way through woodland and meadow, all that the poet needed was the space of five short lines written in a simple folk-lore verse meter. Committing itself so easily to memory it brings the beautiful picture of some brook reflecting the blue sky and flowers and foliage lining its course almost life-like into our vision. In reality the sensitive eye of the lover of nature delights in watching its rhythmical motion and eternal restlessness.

Unfortunately, however, the owner of the grounds happened to be an eminently practical gentleman, believing in radical ways of proceeding. The consequence was a contractor received orders to eradicate the zigzag course and run cement walls along the new straight lines. When being told to have narrow beds prepared along the walls for having nasturtiums planted, the landscape gardener left with the last vestiges of his visions and dreams shattered.

One of the most ingenious treatments of a brook the writer more recently saw at "Compton Garden" in Chestnut Hill, near Philadelphia. The very spacious grounds are famed for their extensive collections of new and rare trees and shrubs. Several distinct laying-outs of Japanese gardens and decidedly the most artistic pond



Brook Scenery at "Compton Garden," Chestnut Hill, near Philadelphia, Pa.

ness, but to the landscape architect this: "Through the flowers and foliage glancing" is suggestive, or even outright inspiring. The possibilities of the treatment of a natural water course within the precincts of park, or when, by chance, traversing spacious private home grounds loom up, never to entirely leave his mind.

A score of years ago I remember a very enticing proposition of this kind. The brook in question having considerable fall, at heavy thaws and severe rain storms, caused annoying washouts which were to be prevented. For the purpose of making the banks secure the landscape gardener suggested natural rock settings and plantations of moisture loving trees, shrubs, and perennials with a strong, thickly growing root system. There was an excellent possibility for the construction of a natural waterfall at hand and in regard to having the stream "Through the flowers and foliage glancing" the landscape gardener, no doubt, had his visions and dreams,

scenery of Philadelphia add to the prestige of the estate. "Compton Garden" also had its swiftly flowing brook with naturally winding course and subsequent flood and washout problems. But fortunately in its founder, owner, and designer, the late John T. Morris, "Compton Garden" had an artist fully competent to cope with the situation. The rockbed and the rocky shore lines of this stream of water constructed under personal direction of Mr. Morris cannot be pictured or described in a way to give the work justice. One needs to see and study the infinitely varied details along its natural course and the more we study the more we are forced to admire the subtlety of vision and the wonderfully clear conception of the elements of beauty in rocks and natural rock composition as applying to the water edge. Our illustration shows the brook in the immediate foreground with a bench around a nearby tree for rest and enjoyment of

what an artist and philosopher once pronounced an enchanting piece of realistic brook poetry. The log cabin in the rear, by the brook, was built by the founder of "Compton Garden" for his hours of relaxation after returning from his city office. He knew the rejuvenating power of free nature and loved to listen to her voices around him. To go down from his mansion on a turbulent November day and in his log cabin alongside the open fireplace hear the driving rain on the roof, the raging of the wind through the crowns of the trees and the deep murmuring of the foaming brook was emotion stirring. Again during the month of May, with door and windows wide open the jubilant song of wooing birds, the buzzing of busy bees and the gleeful prattling of the brook was delight. Thus, when looking at the picture of the brook at "Compton Garden" it is to be borne in mind that the amiable character and simplicity in the composition of the scenery and the distinguished personality of John T. Morris are inseparable.

The out of door fernery in connection with brook and natural stream is one of the most alluring possibilities. However to produce and maintain a luxuriant growth

palustris and *Primula rosea* and *Primula veris* appeal to us. We also know of meadow rue, *Ranunculus*, *trollius* and *valerians* being suitable subjects for our purpose. But not until we have seen the tropical luxuriance and the metallic lustre of the large-leaved funkias, above all of *Funkia fortunei gigantea*; not until we have studied the possibilities of *Iris pseudo-acorus* with its strong flood-resisting root system; and not until we behold the gorgeous color displays of Japanese and Siberian irises can we fully realize the wide scope for artistic compositions along brook and natural stream. It is in the tempered atmosphere near running water where grace in leaf and flower invested in stately specimens of *Spiraea aruncus* and *Spiraea palmata* in beauty vies with the heavy yet highly decorative foliage of *Gunnera scabra* and the different species of *Senecio*. Many are the pleasant surprises we meet with at our work down along the brook and one of the happiest to me was to notice the vigorous growth of all the species of *Astilbe*, especially the incomparable effect obtained by employing the new *Astilbe Arendsi* hybrids close to the water edge. Indeed the large, erect, feathery flower heads in beautiful clear



Brook Planting Late in May on the Author's Grounds, Glenside, Pa.

and beautiful effect outdoors beside a natural stream of water necessitates partial shade and protection against high winds. Therefore the natural ravine with opportunities for rock-pocket construction along more or less steep slopes will prove ideal for extraordinary displays.

Visions and dreams cropping out of a yearning desire to work on some enticing problem are among the most obstinate and tantalizing things in human life. When at last my brook zigzagged in sight I was more than ever bent on a realization of the poet's image with the intention to accentuate the line: "Through the flowers and foliage glancing" as strong as possible. Beginning with the practical part it is self-evident that the moist ground conditions along creek and brook call for moisture loving plants. For lining of our water edge we naturally first think of *Myosotis palustris*, the swamp forget-me-not. In turn the different species of marsh marigolds: *Caltha*

pink shades above a dense growth of glossy green foliage are among the most novel and attractive features of floral display at the immediate brook waterline. The two illustrations of brook views from the author's grounds at Glenside, Pa., convey samples of arrangement and character of vegetation in open sunny positions.

Similar to rock-garden building, landscape architecture in connection with brook and stream brings us closely back to the beautiful in nature. Brook treatment compared with bog gardening and shore planting of lake and pond, however, offers infinitely more variety in highly interesting problems to solve. It taxes our faculty of imagination and technical ingenuity to the utmost when the natural fall of the ground increases the mobility of our stream. In such cases the character of the work calls for unlimited freedom for the landscape architect to follow his conception in regard to form and composition. Any

detailed working plan he would absolutely have no use for.

I am fully aware of the fact that the brook and natural stream traversing public parks or country home grounds is the exception. Sojourns within refined sub-



Funkia Ovata and Astilbe Arendsii, "Salmon Queen," Along the Brookline.

urban and country sections of New York, Philadelphia, and Boston however have convinced me of the exception being by no means a rare one. Evidently what should have been recognized by the owner as a priceless gift, he still remains prone to look at as a troublesome object. Instead of providing for a brimful measure of enjoyment by having a natural stream of water:

*Brightly sparkling on its way,
O'er yellow pebbles dancing,
Through the flowers and foliage glancing—*

we continue building straight lined cement canals for them and at the bottoms have a sadly chastised meaningless flow of water run through our premises. Exploiting of brook problems for landscape architects endowed with the faculty of becoming exponents of poetry offers splendid opportunities for satisfying their ambition. In Europe the subject of late has been given considerable attention and special chapters on landscape architecture in connection with brook and stream appear now in their current literature. To my knowledge very little has been done so far in this direction in this country. The nature of the work itself, however, is so enchanting and the prospects for beautiful results on a highly enjoyable order are so obvious that we can ill afford to further remain disinterested and inactive.

"My dear Mrs. Croesus, may I not put your name down for tickets to Professor Pundit's course of lectures on Buddhism?"

"Oh, by all means! You know how passionately fond I am of flowers."

FROST AND THE PLANTS' AWAKENING

Much experimental work has been done of recent years on the Continent and in America with the object of discovering practicable means of forcing plants to come out of their resting state, and to develop and blossom before their proper season. Among the means which have proved effective are: Etherization, warm baths (submerging the shoots for some hours in tepid water), injecting drops of water into the stem beneath a bud, watering the plants with a weak solution of nutritive salts (nitrates, phosphates and salts of potash), drying, keeping plants in darkness, and exposing the plants to frost. In the case of many plants it has been found possible to awaken them only by a combination of several of these methods.

It seems reasonable to conclude from such facts as these that the resting state of plants in winter is a complex business, and that this state may be disturbed and growth awakened by attacking it at several different points.

Let us endeavor to form a mental picture of the conditions which obtain in a plant in its state of so-called winter rest! There is reason to believe that in the resting state the living protoplasm of each cell forms a resistant outer layer or skin, through which water and gases pass with great difficulty, if at all. In this condition the protoplasm is said to be impermeable. There is also reason to believe that owing to the layers of cork in the stem, carbon dioxide, produced by the cells themselves when they were finishing off their active life in autumn, is imprisoned in the spaces between the cells of the deep tissues, and acts as a narcotic; drugging the tissues as it were. And, furthermore, there is ground for the belief that this same carbon dioxide prevents the ferment or enzyme, diastase, from doing its normal work of changing solid starch into soluble sugar, and if it exert this paralyzing power on this enzyme, may it not also exercise a like effect on other enzymes, the activity of which is necessary for the growth of the



Rich Early June Effect in Brook Gardening on the Author's Grounds, Glenside, Pa.

tissues? In accepting these statements we must picture the cells of a dormant plant as cut off from water supplies by reason of the impermeable outer layer of protoplasm, as drugged by the heavy charge of carbon dioxide in and around the tissues, and as starved by

lack of soluble food-material such as sugar and other substances. Anything which tends to break down one of these barriers to activity *may* aid in awakening the plant, but if several of them can be broken down escape from winter imprisonment is more probable.

Now, it is well known that a low temperature renders the outer layer of the cell's protoplasm more permeable. For example, in a severe frost water escapes from the cells into the surrounding spaces, and its lodgment in these spaces may be detected by the rich green color that frosted leaves assume. Furthermore, when the temperature falls, starch undergoes a conversion into sugar, as may be inferred from the fact of frosted potatoes having a sweet taste. Hence we must conclude that a falling temperature favors the action of diastase in producing sugar from starch. But the presence of sugar means that supplies of food are available, and the loss of permeability of the proto-

plasm means that that food may pass into the cell. Both these conditions are favorable to growth, so if the plant can throw off the drugged lethargy produced by the self-generated poison gas (carbon dioxide), it is free to resume active life and growth. Probably with the loss of impermeability (water- and air-tightness) of the outer layer of the protoplasm, the carbon dioxide imprisoned in the cell escapes, and thus the cell is quit of the anaesthetic action of that gas.

As will be judged from the foregoing, the problem is complex and difficult, and cannot be set forth in simple terms. In this case, though the explanations are incomplete and not altogether free from obscurity, we may see—as in a glass darkly—something of the nature of the struggle whereby the plant escapes from the grip of winter, and something of the way in which a touch of frost helps it out of its prison.—*Gardeners' Chronicle* (English).

Keeping Bees in the Garden

H. W. SANDERS

There are few gardeners, either professional, or amateur, who need to be informed of the beneficial effects of the visits of insects to their blossoms, or the difficulty of obtaining fruit or seed from many of these without insect help. Chief amongst these visitors to the nectaries of flowers is the honey-bee, the only insect besides the silkworm that is of sufficient economic importance to be kept in captivity—or in such measure of captivity as to enable its produce to be gathered for the service of man.

There was a time, not so long ago, when fruit-growers and beekeepers were almost at enmity with one another, for the fruitman charged the bees with destroying fruit, and the beekeeper found that indiscriminate spraying of the orchards during fruit-blooming time killed his bees by the thousand, often compelling him to seek another location for his apiary. Now, however, all that is changed, for all progressive orchardists know that bees cannot damage sound fruit, and that their visits to his blossoms in the spring when but few other insects are abroad ensures the setting of a good crop of fruit.

Cucumbers, pumpkins, squash, citron, and many other of our garden crops need bees to cross-fertilize them, and the gardener who keeps a few colonies will find this a service that is most valuable to him.

It is however for their honey that bees have been primarily kept for many centuries—for bee-culture goes so far back that very practical works on their management are extant in the Roman Classics, while the Bible is full of references to bees and honey. Until the last century or so sugar was unknown and honey was about the only sweet in general use. The laws of nearly every civilized country reflect this and the writer received a clipping from an English newspaper recently in which an action was taken in court for the recovery of a swarm which had got away and had been hived by some other person than the owner. The case was decided against him on the strength of a law many centuries old, whereby the owner of a runaway swarm has claim to them only as long as he can follow and keep his eyes on them. This, it may be mentioned, is the basis for American law on the subject which is substantially in agreement with it.

Bees were brought over from England very early in the history of the first American Colonies, for we find legal decisions in early days in which bees were mentioned. Swarms escaped from the Pilgrim fathers' apiaries and took to the woods, gradually spreading westward, and they were known by the Indians as the

"White Man's Fly," and were regarded as an omen of the spread of white settlements. Even now in remote districts a belief lingers that a swarm always flies west, though there is no basis in fact for it.

There are an extraordinary number of superstitions connected with bees that one continually meets with, sometimes from the most unexpected sources. Perhaps the mysterious community life that even yet baffles the understanding, and invokes our wonder, caused these ideas to spread. One of the most picturesque is the belief that when there occurs a death at the beekeeper's house, the bees must be told that they may attend the funeral. The explanation lies in the fact that bees gather the natural gums of trees to make the "Propolis" which beekeepers know so well. This attracts them to fresh varnish, and when a varnished coffin is carried out, bees will often hover around and alight thereon.

With the improved methods of handling bees that have been evolved in the last 50 years it is now possible to produce crops of honey far in excess of anything our forefathers dreamed of, and from 100 to 200 pounds of honey is frequently obtained from a single colony in a season. But little care is needed, though it is most essential that it should be given at the right time. When the horticultural show comes around in the fall it gives no little pleasure to be able to add a neat pile of honey to one's other exhibit.

There is an aesthetic side to beekeeping that every nature lover feels, and the pleasant murmur of the hives on some golden day in summer is the most peaceful sound that nature affords. The visitor to the garden will nearly always be interested to pause awhile by the hives on their bit of well-kept lawn, and to watch the busy thousands coming and going, the watchers at the door, the water carriers, and all the other fascinating workers of the hive. Where a gentle strain of Italian bees are kept there will be not much likelihood of any trouble from stings, and the prudent beekeeper is always careful to avoid the exposure of honey, or any other exciting element that might cause trouble.

THE GARDENERS' CHRONICLE has pleasure to announce that articles will appear each month giving practical direction on the care and management of bees. These will be written from the standpoint of the amateur rather than that of the professional beekeeper and if they are a help to those who keep bees, or to those who intend to do so, we shall feel that they have filled their purpose.

Plant Names and Their Meanings

By WILLARD N. CLUTE

THE names of plants have ever formed an important part of Botany. The collecting of plants and the running down of their names by the use of a "Key" was long considered the end and aim of plant studies and even now this amusement has not entirely ceased to interest the botanizer. The question as to the exact name each plant should bear, originated shortly after the Christian Era and still forms the subject for numerous acrimonious debates among the devotees of "the Amiable Science."

Meanwhile the meanings that lie in plant names have received scant attention. To be sure, nearly all botanical Manuals attempt to give the derivations of the generic names but apparently with only indifferent success, if we may judge from the diversity of derivations suggested. Since the generic names are usually taken from the Latin and Greek, a correct derivation ought ordinarily to be easy, but frequently it is far from being so. In the case of the common or vernacular names, the difficulties increase. There is no recognized authority upon which we may depend. Common names have been derived from all countries and from all languages. They have been given by philosopher and peasant, physician and farmer, civilian and savage, soldier and statesman. Learning has given us names derived from classic sources; ignorance has mispronounced and misapplied these names and coined others. As a result, the vernacular names present many puzzling problems which stand as a challenge to our ability, but the possibility of their solution adds zest to the study. Moreover, a wealth of tradition, poetry, folklore, fancy, custom, religion and other phases of life lie embedded in these names like jewels in the mine, and any extensive investigation is sure to be rewarded. Some of these names are older than the science of Botany itself; others are even now in the making.

It is manifestly impossible for any single individual to satisfactorily cover the whole field of plant names, but if any progress is to ensue, a beginning must be made, and it is purposed to set down here some observations on the subject which we trust will call out from others the additions, corrections, and further suggestions that the subject merits.

A good place to begin our studies is at that group of common, showy, and often poisonous species that long stood first in the botanical Manuals and is known as the *Ranunculaceae*. This word is only part of the title of the group. It should really be *Plantae Ranunculaceae*; that is, *Ranunculus*-like plants. As usually written, however, the names of plant families leave off the first word. Inquiring into the meaning of *Ranunculus*, we find that the word is derived from an animal rather than from a plant. *Rana* is the Latin word for a little frog and, because many plants of this group grow in marshy places where frogs abound, the old naturalist Pliny gave the name *Ranunculus* to one of the typical genera. From this name came the designation for the family and also for the order *Ranales* which includes, besides the *Ranunculaceae*, the *Magnoliaceae*, the *Anonaceae*, the *Berberidaceae*, the *Lauraceae*, and several others.

In any discussion of plant names it is unnecessary to devote much attention to the specific names. These are usually descriptive of plant parts and such other characters as size, habitat, color, abundance, and the like. Various proper names used are also self-explanatory. Some specific names, however, deserve mention, as for instance in *Clematis viorna* where the specific name comes

from two Latin words meaning ornament of the wayside. *Ranunculus sceleratus* is of interest from an occasional mistranslation which makes it celery-leaved. The real meaning of *sceleratus* is acrid or biting. *Zanthoxylum apifolium* may be properly translated celery-leaved for that is what the name really means.

Turning to the generic names, we find many of them dating back to periods earlier than the Christian Era. Some have been given in honor of heathen deities, others are the names of ancient plants entirely unrelated to the plants which now bear them, the titles having been misplaced through the vicissitudes of time or the carelessness of early writers, and still others are of such obscure derivation that the translations are at best mere guesses.

Paeonia, the genus of plants we now call peonies, was named for a mythological personage, the physician Paeon, who is reported to have used the plant in medicine and to have cured the god Pluto with it. Old fashioned folk call the plant, piny, perhaps with better authority than we have for calling it peony, for properly pronounced the generic name is *Pi-o-ne-a*, easily shortened to piny. The larkspur genus *Delphinium* is named for a fancied resemblance of the flowers to the classic figure of the dolphin (*Delphin*).

Anemone is usually supposed to be derived from the Greek *anemos*, meaning the wind, but the latest editions of Gray's Manual say it is a corruption of *na-man* the Semitic name for Adonis "from whose blood the crimson-flowered Anemone of the ancients is said to have sprung." Our first derivation seems to be more in favor for it has given the vernacular name of windflower to several species. Wood's "Class-book of Botany" says that these plants were called anemones because many species love windy places. Whatever the derivation, it may be mentioned in passing that the accent should be placed on the third syllable making the word sound exactly like Annie Mony. Thus far this has been overlooked by those sticklers for the new way of pronouncing *Arbutus* and *Gladiolus*. *Anemonella*, the generic name for the true anemone, is a diminutive of *Anemone*.

The authorities also fail to agree as to the derivation of *Clematis*. Wood says it is from the Greek *klema* a vine or tendril; Gray says it is a name given by Dioscorides to a climbing plant with long and lithe branches. As to *Adonis*, Wood says "Feigned to have sprung from the blood of Adonis when wounded by the boar" but Gray opines that "Adonis was a favorite of Venus and after death was changed to this flower."

The globe flower genus, *Trollius*, is another bone of contention. According to Wood it is derived from *Trol-len* meaning golden. Britton's Manual derives it from *Trol*, round. Webster's Dictionary says it is from *Torolyn*, the Hungarian name for the plant, and Gray explains it as from *Trollblume*, the German common name. *Troll*, it will be remembered, is the German name for a mischievous dwarf or fairy. Perhaps the flower is named for the troll! Anybody is at liberty to adopt whichever derivation seems to him most correct or to make one of his own. In any event, one can hardly look for accuracy in lesser writers when the authorities differ so markedly.

Dioscorides is responsible for the generic name *Thalictrum* applied to the meadow rue, which Wood says means "to be green." *Helleborus*, usually regarded as of un-

known derivation, is said by the same author to come from two Greek words which mean "the food that causes death." The genus is well known to be poisonous. *Aquilegia* is derived from *Aquila*, the eagle, in allusion to the spurs which suggest the talons of a bird of prey. *Aconitum* is reported to be derived from the Greek *Akoniton*, meaning without dust, because the plants grow in rocky places, while *Hydrastis* is assumed to come from the Greek word for water, though the translation does not go unchallenged.

The other genera of the *Ranunculaceae* are somewhat more easily interpreted. *Actaea* is the ancient name for the elder whose leaves the plants of this genus are said to resemble. *Cunicifuga* is from the Latin *cimex*, a bug, and *fugare* to drive away, accounting for the common name of bugbane. *Zanthorhiza* is the descriptive Greek for yellow root, and *Nigella* is the diminutive of *niger*, meaning black. *Coptis* means to cut, in allusion to the divided leaves. *Caltha*, according to Wood, is from the Greek for goblet, the flowers being like golden cups. Gray says it was the ancient Latin name for the common marigold which, however, does not necessarily invalidate the original derivation. *Myosurus* is, in Latin as it is in English, mousetail, being so called because the carpels are attached to a long slender axis. *Troutvetteria* is named for E. R. von Trautvetter. Gray says "an able Russian botanist" but Wood says "German" and the name looks it. *Hepatica* refers to the liver in the original Greek because of its leaves which are supposed to be shaped like the liver, and *Eranthis*, or the winter aconite, means spring flower. *Isopyrum* is the ancient name for some species of fumitory.

The number of vernacular names bestowed upon a given species depends in part upon its abundance, in part upon its conspicuousness, and in part upon its usefulness. Some may have as many as twenty common names and others lack a single one. It is interesting to note that the best known common names are nearly always generic; that is, they are applied to a number of species, instead of one, with, or without, qualifying adjectives. This is the case with *Ranunculus* where buttercup and crowfoot are common designations even when the flowers show no hint of butter color and the roundish and often undivided leaves could scarcely be likened to a crow's foot. Such adjectives as ditch, water, mountain, tall, dwarf, early, and the like are self-explanatory as in the case of the specific names; in fact, they are very frequently literal translations of such names.

The names of obscure derivation are the ones of most interest. Take, for instance, the word "knops" in such terms as golden knops applied to several species of *Ranunculus*. This is archaic English for a flower-head and in all probability goes back to the Teutonic knopf or its equivalent, meaning a head, bud, or button. Spearwort, a generic term for several small species of *Ranunculus*, is derived from an Anglo-Saxon word meaning a spire or shoot just as we still say a "spear" of grass. In all probability the spears used in combat were similar though larger spears.

The three common species of *Ranunculus*, *R. acris*, *R. bulbosus*, and *R. repens*, naturally have the greatest number of common names. They might also be said to be joint owners of a number of names referring to their color, as yellow gowan, horse gold, gold balls, gold cups, gold weed, butter rose, butter cress, butter daisy, butter flower in addition to buttercup. Several of these terms may be applied with equal propriety to other species of the genus. The word gowan is now used in Scotland to indicate the daisy, but it once meant any kind of a flower or bud. When Burns wrote of "gowans fine," he doubtless meant wildflowers in general. Butter daisy is a

different rendering of yellow gowan. The word rose is another term that once had a less restricted meaning than we allow it at present, as witness rock rose, Christ-mas rose, rose moss and rose of Jericho. Butter rose is simply a butter colored flower. In horse gold, the word horse implies coarse, common, or spurious. It is often thus employed in flower names, as horse-mint, and horse-radish.

The names blister flower, blister wort, blister plant and biting crowfoot are applied to several species noted for their acrid and biting juice, especially *R. sceleratus*, *R. bulbosus* and *R. acris*. The name of St. Anthony's turnip, applied to *R. bulbosus*, probably has the same suggestion. The bulbous base of the stem is not unlike a turnip in shape, and St. Anthony is the saint above all others for which hot and blistering things might properly be named. This species is also called St. Anthony's rape. *Ranunculus sceleratus* is called water celery and celery leaved crowfoot, but in reference to its leaves and not as a translation of the specific name. The worthless properties of this species have earned for it the name of cursed crowfoot, but it is apparently not the only species cursed for *R. arvensis* bears the names of hell weed and devil's claws. To this species also belong starve acre and hunger weed. The plant is said to receive the last two appellations because when it is present in the field the crop will be short and the owner brought to want. Devil's claws quite likely refers to the way the plant lays hold on the field rather than to any particular thought of the devil. *R. repens* is called ram's claws though no ram we have ever seen had claws. Possibly the name is derived from the Icelandic *ramr*, meaning strong, in allusion to the way the species grasps the soil. Sitfast is another name applied to this plant whose hold on the soil makes it especially applicable.

Ranunculus ficaria is called figwort from the fig-like shape of its roots. It also bears the name of lessercelandine, the true celandine being a yellow-flowered plant of the poppy family. Another of its names, crain, is unmeaning enough until we discover that crain or cran is an ancient name for marsh, hence cranberry and perhaps crane, a storklike bird. *Ranunculus trichophyllus*, owing to its much divided leaves is known as water milfoil. The true milfoil is usually regarded as belonging to the yarrow genus (*Achillea*). Double forms of *R. acris* are sometimes known as bachelors' buttons, as are many other buttonlike flowers. Finally, cuckoo-buds applied to some species of *Ranunculus* finds authority in Shakespeare where

"Cuckoo buds of yellow hue

Do paint the meadow with delight."

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THE GLORY OF A NATION.

The true glory of a nation is an intelligent, honest, industrious people. The civilization of a people depends on their individual character, and a constitution which is not an outgrowth of this character is not worth the parchment on which it is written. You look in vain in the past for a single instance where the people have preserved their liberties after their individual character was lost.—E. P. WHIPPLE.

ADVANCE IN SUBSCRIPTION RATE.

With the January 1920 number, the subscription rate of the *Gardeners' Chronicle* has been advanced to \$2.00 a year.

Present subscribers wishing to renew subscriptions from date of expiration may do so at the old rate up to February first.

Why Fruit Trees Do Not Bear

ONE of the most trying and disappointing experiences for a fruit grower, is to have his orchard reach an age when he expects a crop, only to find that it does not produce. As chief of the division of horticulture at the Oregon Agricultural College one of the most common letters that I received from growers was, "Why don't my trees bear?"

To answer this question, we can to advantage, divide the trees into two classes. First, trees which do not bloom; second, trees which bloom but do not set fruit. The first class is influenced by many factors, such as variety and vigor. Many a grower has expected trees to bear at an age when they naturally could not be expected to bear. Some varieties will begin bearing at five years of age. But on the other hand, some varieties will not bear crops until they are seven years of age, and in some cases much older.

I have known Northern Spy and Yellow Newtown orchards to be unproductive until they were twelve to fifteen years of age, but under such circumstances, I might add, wrong orchard practices had frequently been resorted to. The vigor of the tree determines the production of blossoms.

The heavy pruning and intensive tillage desirable for trees from one to five years of age, is undesirable for a tree from five to ten years of age, and if the practices are continued may keep some varieties of fruit from bearing crops until they are fifteen years of age. With trees from five to ten years of age in normal vigor, less tillage and irrigation, not very much cutting back but more of a thinning out process in the pruning, will encourage trees to come into bearing.

It is to the second group of trees, namely those which bloom but do not set fruit, that we need perhaps to give the greatest attention. For though one may be disappointed if trees do not bloom, the disappointment becomes even greater if the trees bloom, yet fail to produce.

There are many factors to be considered in answering the question why some trees will bloom and yet fail to produce fruit. The climate is one of the greatest factors for us to consider, and Jack Frost takes an annual toll from many trees. Not perhaps so much the actual freezing of the tissues, but the rapid thawing of frozen tissues is responsible for the huge loss in the early spring. Where orchards are not exposed to the direct sunlight early in the morning, or where a bank of fog or cloud drives in, we often notice that the damage is little or nothing.

There is a relation between the vigor of the trees and the amount of frost damage experienced. Between the condition of vegetation and effect of low temperatures.

The degree of development of the vegetation in the spring at time of frost, and its relation to resulting damage is a very interesting one. For a number of years, I have observed that trees which are just starting to grow, or trees which have reached the blooming or setting period suffered less from frost damage than trees which are half way between in their development.

Under the heading of climate, we must consider cold weather during the blooming period. There may not be frosts, but the temperature is so cold in the middle of the day that insects and especially bees will not fly. When the temperatures are around 50° or less, very few bees will work, and I have known seasons when we experienced practically no killing frost, but a protracted cold raw spell. Such a spring is generally followed by a very light set of fruit.

Cold rains and driving storms in the spring wash out the pollen and prevent the work of insects. In fact, high winds interfere with the pollination of tree fruits if they are insect pollinated. The walnut and filbert on the other hand, are pollinated by wind, and a certain circulation of air might be an advantage in such cases.

Diseases such as scab on apples and pears, and brown rot on the cherry and prune, will often destroy all the blossoms. Trees which have been severely winter injured are often so devitalized that they seem to lack vigor and strength to develop blossoms.

The busy bee is the most important factor in the pollination of our tree fruits. Fruit districts need more and more of these valuable insects.

The vigor of the trees is one of the biggest factors in the setting of fruit. When trees come into bloom for the first time, they will often produce a profuse blossoming, but give a very poor set. The d'Anjou pear is one of the best examples. This tree is often white with blossoms by the seventh year, but it is often very unfruitful.

As this variety becomes older, it seems to gradually overcome this condition and begins to set better. Undoubtedly some of the young orchards which bloom heavily but set poorly are somewhat too vigorous to bring about the best setting of fruit.

In our older districts however, of the northwest, with pear, apple or prune orchards, the lack of vigor is responsible for the poor set. Leaving too much weak and devitalized wood in the trees, the lack of thorough tillage, and above all the lack of keeping the soil supplied with nitrogen is the biggest factor in the failure to set fruit.

In speaking of pollination, there are certain terms which we use that we should all understand. The word "fruitful" means the variety has ability to produce fruit. This fruit may or may not have seeds. "Barrenness" means the variety will not produce seeds which will germinate. "Fertility" that the variety will produce seeds which will germinate, and "sterility" that the variety will not produce seeds which will germinate.

Now while a variety may be fruitful, or even fertile, when planted by itself, still nature seems to favor the crossing of fruits, and where two or more varieties are planted together, there is not much danger but what a good crop will be secured.

However, there are several glaring exceptions. For example the Spitzenburg apple is almost sterile, and the Winesap produces no pollen. So that a combination like that would be bad.

The question is often asked how does pollen affect the fruit? It seems to affect the size, making the fruit larger, it gives more specimens to the tree and often makes them heavier and firmer. There is a seeming correlation between size and weight and number of seeds. Heavy apples have plenty of good seeds.

Again the quality, and firmness, because of the presence of the seeds, is greatly improved.

Color is probably not affected directly, for if there is any effect of pollination on color, it would be indirect owing to change in size of specimens. A close checking on this subject over a good many years, causes us to conclude that color is not generally affected by pollination.

The bright bands of red on yellow apples, or the different colored bands of red on certain apples which run from the stem to the calyx have been attributed as a result of pollination but a close study will show that this is really a bud variation character and not a pollination character.—C. I. LEWIS, in *American Fruit Grower*.

VIEWS
of
HOME
GROUNDS



A View of the House from the Golf Links. Note the Terrace Located on the North Side of the House.



A View of the House Facing the Gardens. The Gardens Are Arranged to Furnish a Most Pleasing Vista From the House.

THE COUNTRY ESTATE OF SAMUEL HESSBERG

ROSEMONTE
FARM

CEDAR HILL
New York



A View of the Sunken Rose Garden From the House, With the Rock Garden to the Left and the Rambling Garden to the Right.



View From the Porch of the House, Showing a Well-Arranged Planting of Shrubs and Trees With the Hudson River in the Distance.

Descriptive List of Hardy and Semi-Hardy Primulas

HENRY J. MOORE

LITTLE, if any, systematic experimenting has been done with the hardy and semi-hardy species and varieties of the *Primula* in the United States and Canada. Perhaps this is on account of the supposition that few of them are hardy enough to withstand the rigorous winters. Very few are entirely hardy as disclosed by the test of the following kinds, all of which have been grown for at least two seasons in the Queen Victoria Park, at Niagara Falls. Many beautiful kinds, however, are with a little protection so hardy that they survive the winters practically unharmed, and in Spring furnish a display which well repays for any labor devoted to their culture.

Generally speaking the plants in the following list merit the attention of all who are interested in spring gardening. As botanical descriptions would be of little use to horticulturists, the subjects are described almost purely from a horticultural standpoint.

1. *Primula auricula* varieties (The Auricula).—There are many beautiful varieties of *P. auricula*, some of them almost hardy. They are divided into classes according to some distinctive flower character, the principal being the grey edged, white edged, green edged, selfs and Alpines. In these classes the varieties are named and standardized. Many of the plants survive our winters with a protection of leaves or litter, and are unique for the herbaceous border. If potted in a mixture of one part of loam, leaf soil, rotted cow manure and coarse sand, with a little broken charcoal, and wintered in protected cold frames, the plants make splendid flowering subjects for the cool greenhouse during Spring.

2. *Primula cortusoides*.—The deep rose colored flowers of this species are borne well above the foliage to a height of fifteen inches. The leaf stalks and undersides of the leaves are hairy. Several flowering stems are produced at the same time. The plant is an excellent and graceful subject for semi-shady nooks in the border where it requires a light sandy soil with plenty of humus. It is hardy with slight protection. The flowering period is from May 15 till July.

3. *Primula cortusoides*, var. *Sieboldii*.—The varieties which have originated from *P. cortusoides* are most beautiful subjects for the shady border. They are hardy and require protection only in zero temperatures. A fairly moist light soil is necessary to their welfare. Their flowering period is approximately May 20 until June 30. The variety *Sieboldii* and its hybrids should be grown in every garden.

Queen of Roses, a plant with deep rose pink flowers, umbellate, about nine flowers to the stem, which reaches a height of twelve inches, several stems being produced. The foliage is of a medium green.

Maiden's Blush—The flowers are white suffused with rose, and twelve inches high.

Sirius—The large white flowers of this variety are from one to one and a half inches in diameter (as are the two fore-mentioned ones). The foliage is of a light green. *Cortusoides* and its varieties are all excellent for pot culture.

4. *Primula capitata*.—A plant with flowers of a deep violet blue, arranged densely in globular heads, which attain a height of about nine inches. The flowering stems are covered with a white powder. The leaves are wrinkled and toothed, and are powdered on the under side. The flowering season is from May till July. A semi-shady, fairly dry position is necessary. The plant is better adapted to the rock garden than elsewhere, where it must be protected during winter. If grown in a cold frame and flowered in a cool greenhouse, it makes a charming pot plant. The flowers must be shaded from the sun.

5. *Primula denticulata rosea*. This beautiful variety should be generally grown. The flowers are rose purple with a yellow eye. The inflorescences which sometimes contain more than fifty flowers are dense and globular, and are in flower from April 13th till May 26th. The plants are excellent for planting during Fall in beds or borders, where Spring flowers are required. If planted nine inches apart, the bed will be as distinctive as a bed of Hyacinths, which at a short distance the flowers resemble.

The plants may be substituted for bulbs or be used in conjunction with them. A soil containing much leaf soil is excellent for their culture. The leaves are hairy, are covered with a white powder, and are coarsely wrinkled and toothed. The flowering stems attain a height of nine to twelve inches.

6. *Primula denticulata alba*.—A white flowered form of the above similar in all respects except in color of flowers, and of leaves which are a paler green. The plants may be used to furnish a bed of white flowers for Spring flowering or be mixed with the variety *rosea*.

7. *Primula denticulata cashmeriana*.—This variety requires somewhat different cultural treatment than the two forementioned ones. It should be planted in a light soil in a somewhat raised position, so that its crowns will be well above water which in spring may collect, otherwise they will rot. A moderately sunny position is necessary. The plant flowers from April 18th until May 20th. The flowers are light purple with a yellow eye, and about twelve inches high. The undersides of the leaves are covered with a beautiful golden colored dust. The inflorescence is an umbel similar to the other varieties. Not being entirely hardy a protection of litter must during winter be afforded.

8. *Primula elatier* (The Oxlip).—This perfectly hardy plant is a cross between the English Primrose, *P. vulgaris*, and the Cowslip, *P. officinalis*. The flowers are pale yellow and are horizontal or drooping on their stems. They are at their best from April 15th until May 15th. They reach a height of nine to twelve inches. The petioles of the leaves are somewhat winged. The plants are very useful for planting out in beds or borders during autumn for spring flowering. It is best to afford a light covering after planting. As a carpeting plant for beds of tall bulbous plants, it is good, and should be more generally used. May be propagated by division, or raised from seeds.

9. *Primula frondosa*.—A little alpine species with purple flowers. The stems and leaves are covered with a white powder. In height it is only four to six inches. It requires a semi-shady spot, with some protection during winter. It flowers from May 4th till the 26th. The plant is especially adapted to the rock garden.

10. *Primula japonica* varieties (Japanese Primroses).—Plants equally desirable for outdoor or indoor culture. The following varieties are all hardy and of great value. They are perhaps the best of the genus for associating with aquatic plants, as they are entirely at home along the margins of pools or streams, if planted in positions where the roots are above the water line. In a semi-shady position in the herbaceous border where a deep, rich and moist soil pertains, they flower splendidly, and over a considerable period, namely, May 30th until July 15th. The plants are easily raised if the seed is sown as soon as ripe.

Rose Queen.—A variety with handsome rose pink flowers, about eighteen inches high.

Blush Beauty.—The flowers are a delicate blush white.

Splendens.—A plant with large fiery crimson flowers. The tallest variety, reaching a height of twenty-four inches. A most magnificent hardy Primula.

11. *Primula officinalis* (The Cowslip).—A hardy plant. The flowers of which are pale yellow, more or less drooping from their stems. The height is various, usually from nine to fifteen inches. This species is interesting as being one of the supposed parents of the Oxlip.

12. *Primula pulcherrima*.—A half hardy perennial, which has large handsome purple maroon flowers, borne in tiers on long stems, after the manner of *P. japonica*. The leaves are dark green, nine inches long, and are wrinkled and toothed. The species is excellent for border positions, in sheltered localities where it will probably survive with a covering of litter. As a pot plant for greenhouses with intermediate temperature, it is excellent and its color renders it valuable. In very cold localities it is better to carry the plants over in cold frames, than to subject them to the winter with chances of failure.

13. *Primula veitchii*.—A new half hardy perennial species of Chinese origin. The flowers are of a beautiful rose purple color, and are borne in umbels. The several stems reach a height of about twelve inches. It is best to winter the plant in frames. The leaves are hairy and somewhat palmate in shape. A greater percentage of plants will germinate if the seeds are sown as soon as ripe. The flowering period is from May 29th till July 1st.

14. *Primula vulgaris* (Common Primrose).—A hardy well-known perennial species, native of Great Britain. It may be used to advantage in many positions. Splendid for naturalizing in the wild garden or woodland, for massing in the herbaceous border, or in the rock garden. It does equally well in a stiff loam as in a light rich soil. It is easily raised from seeds or by division of the root stock. Height of the flowers about three inches.

Primula vulgaris varieties.—There are several white and also one or two good blue flowered varieties of *P. vulgaris*, which go under the garden name of *P. acaule*. In regard to hardiness, uses and other qualities, they are equally as desirable as the species, and require the same treatment. They flower from April 19th till May 28th.

15. *Primula variabilis* (The Polyanthus or Cluster Primroses).—The *Polyanthus*, supposed to be a cross between the common Primrose (*P. vulgaris*) and the Cowslip (*P. officinalis*) has many splendid varieties. They are all hardy and useful for Spring flowering in beds or borders. Whether mixed or planted in separate colors, they are hard to surpass for naturalizing in the wild garden or woodland. For the rock garden they are excellent, and equally so for pot culture in cold frames and cool green-houses.

The following varieties are standard. In each case the flowers are umbellate and are held well above the foliage, differing in this respect from the Primrose proper.

Munstead Giant White.—A plant with large white distinctive flowers, and deep orange eyes. The flowering stems are very strong, and about nine inches long. The plant flowers from April 15th till May 30th.

Rose in Rose Yellow.—The flowers of this charming variety are of a golden yellow with deep orange eyes. Height about nine inches. This is a vigorous variety and excellent for beds and borders.

Munstead Giant Red.—The large dark red flowers of this variety with their prominent orange eyes are very attractive. The flowering stems are about twelve inches in length. A most vigorous plant, and adapted to all the forementioned uses. It flowers from April 30th until June.

Ruby Red.—The flowers are of a beautiful ruby red with eyes that are alternately striped with orange and yellow, giving a curious effect. They attain a height of six to nine inches. The flowering period is from April 28th until June 6th. The leaves are of a medium green.

Barr's Orange Yellow.—This variety merits attention not only on account of its attractive flowers which are orange yellow with deeper orange eyes, but for the reason it will bear twenty or more flowers to the umbel. It is one of the best. Its height is from nine to twelve inches. The flowering period is from May 2nd until June. The leaves are of a medium green.

Gold Laced.—The gold laced varieties are not extremely showy, therefore not so useful as the other varieties. For pot culture or for exhibition purposes, they are interesting. For bedding or naturalizing they are of secondary importance. Their height is from six to nine inches.

Wooller's White.—The pure white flowers of this variety have the usual orange eye. The foliage is light green. The flowering period is during May and June.

All the *Polyanthus* varieties may be raised from seeds sown in Spring, or as soon as the seed is ripe. They may also be readily propagated by division during early Fall.

PRIMULA MALACOIDES

BEAUTIFUL is *Primula malacoides*, the half hardy or cool greenhouse species. Its delicate pale mauve or lilac flowers, which are delightfully perfumed, are borne tier upon tier on long scapes, the flowers comprising each tier, with their long pedicels being whorled or verticillately arranged along the flowering axis, forming inflorescences which stand well up above the foliage, the deep green of which brings out in bold relief and enhances, if this were possible their delicate tints. The plant is very floriferous. It is, however, the combination of foliage and flowers so harmoniously blended which affords the charm and distinctiveness not surpassed by any other member of the genus.

For greenhouse culture, and when in flower for the dwelling house or for any decorative scheme pertaining thereto, such as grouping with ornamental flowering plants or ferns, or for table decoration, it is equally desira-

ble. The duration of its flowering period is long, it may be said to be almost perpetual.

Primula malacoides alba, a white variety, is with the exception of color identical with the type, and may be used as a companion to the species in any decorative scheme, while both of these are excellent companions to the old *Primula stellata* varieties so well known to florists. It would appear that these lovely primulas will, for a time at least, supersede many of the older kinds. *Primula malacoides* and its variety *alba* lay claim to a distinction enjoyed by few primulas, if any, in that they are equally as desirable for filling baskets as for pot culture. This statement may be doubted by those who have seen the plants when commencing to flower, as the inflorescences grow quite vertically and are closely bunched; ere long, however, they fall gracefully downward in light feathery sprays forming a perfect fountain of bloom, through which the green of the leaves is interspersed in attractive combination.

Primula malacoides may be increased by seeds or by division of the root stock. In regard to culture, no factor should discourage or deter any grower. No greenhouse primula is easier to grow. Soil and general requirements are practically the same as those suited to the Chinese primula, *P. sinensis*, and to *P. stellata*. A fairly light soil composed of fibrous loam one-third, leaf mold and sand two-thirds, screened through a one-inch screen will for potting purposes suffice. A small quantity of bone meal should be added to the compost.

When sowing the seed, the surface layer of soil in the seed pan should be screened very finely. As the seed is small it should be covered very lightly, not more than its own depth in any case. Sow during February, March or April, place the pans in a temperature of 55 to 65 degrees, and shade from bright light until germination takes place; as soon as growth is noticed remove the shading material, and when the seedlings crowd each other, transfer singly to boxes filled with light soil. When sufficiently large transplant into two-inch pots allowing the plants to remain until well established, then repot into fours.

When sufficient roots have been formed to justify the procedure apply Clay's fertilizer, one ounce to two gallons of water once weekly, remove the plants to a shaded cold frame or to a cool shaded part of the greenhouse, afford plenty of air, and spray the foliage daily in hot weather, not, however, during the hottest part of the day. Early in October take the plants from the frame and repot into six or seven-inch pots, in which they should flower. As soon as established in these continue to afford liquid manure as advised, until the plants are in full flower. After flowering discard the old plants, with the exception of a few which may be experimented with as specimens for another year, or for propagation by division.

When utilized for filling wire baskets a single plant will adequately furnish one of ordinary size. The baskets may be filled ere the flowering stage is reached. It is likewise advisable to fill them with plants in full flower, as whatever the method employed the result will be the same.—EXCHANGE.

Why not plant nut-bearing trees? Surely a beech tree gives as much shade as an oak, and a walnut as a maple. Why not nut-bearing trees as the final choice?

Horticulture promotes health, furnishes appetizing and invigorating food, is a most delightful means of recreation, cultivates a refined taste, induces a spirit of cheerfulness, and awakens a sympathy with nature and a love for all the Creator's works.

An English Cottage Garden

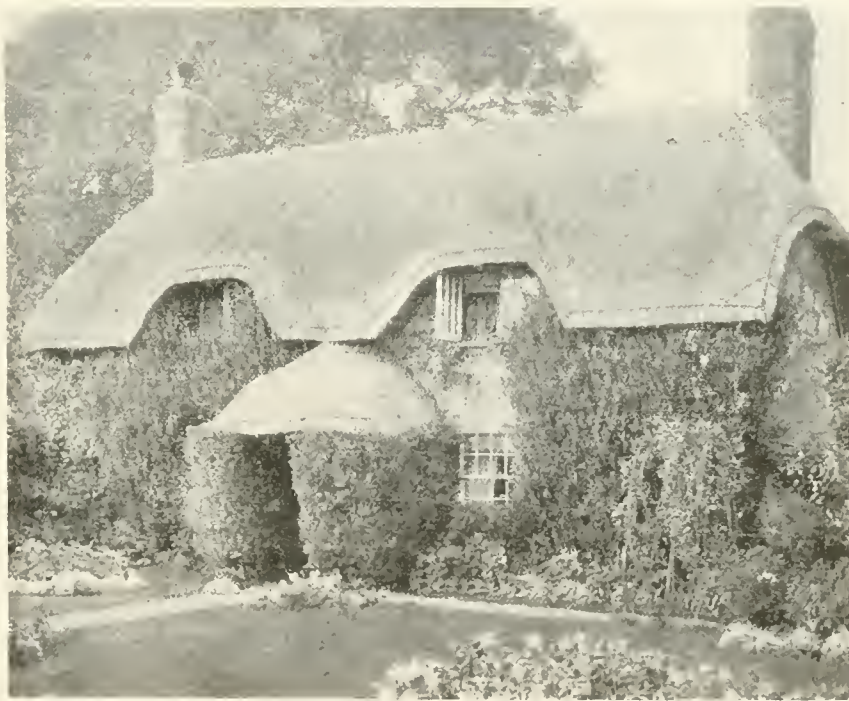
AMONG the many pictures afforded by the English country-side, few can be found more charming than the little peeps of harmonious coloring and form oftentimes met with in sequestered villages, where Roses climb at will beneath the overhanging thatched eaves, clambering up to the chimney and garlanding it with a wealth of blossom. As one walks up the winding village road, one notes how well the walls are clothed with climbing plants. Here the whole front of a cottage is veiled in pink summer Roses, and not only are these small summer-blooming kinds employed, but on many cottage wall other varieties may be noticed. *Reve d'Or* is a lovely Rose, and is often used on cottages. It is a very rapid grower, and will cover the side of a house in a few years. When garlanded with its golden-fawn blossoms, which cluster so thickly as to almost hide the leafage, it is indeed a "Dream of Gold." The foliage is also abundant and graceful, being distinct from that of other Roses. Here and there in the south-west *Maréchal Niel* may sometimes be seen revelling in the

sunshine on a white-washed wall and bearing a goodly crop of handsome deep golden-yellow blossoms, while climbing *Captain Christy*, *Lamarque*, and many others very often take the place of the more commonly grown cluster Roses. Here, one side of a cottage is wreathed with *Jasmine*, a mauve *Clematis* threading the thick growth and mingling its blue stars with the white clusters of the *Jasmine* flowers. Here against a white-washed wall crimson *Hollyhocks* glow, here a flowering *Myrtle* surrounds a lattice window, here the *Passion-flower* has draped a gable with a veil of greenery, studded in the summer with blue or white flowers, and in the chill autumnal days with innumerable fruits of golden-orange that gleam like fairy-lamps amid the dark foliage.

Throughout most months of the twelve, cottage gardens possess some feature of interest. In the darkest days of the year there are the Christmas Roses, and the Winter *Jasmine* mingles its golden flowers with the crimson berries of *Cotoneaster microphylla* over the porch. Then we have the vivid scarlet of *Pyrus japonica* against the white-washed house and the white mantle of the *Arabis*, often, in the genial south-

west, in full beauty ere February has passed away, clothing the rude stone-retaining wall at the pathside. A little later the purple Rock Cress (*Aubrieta*) takes its place beside the *Arabis*, and the bright yellow of *Alyssum saxatile* gleams by the pathway. By the little gate that leads to the road, spreading its outer branches over the hedge, stands a great bush, almost a tree, of *Rose Maiden's Blush*, thickly studded in the early summer with fair, flesh-pink blossoms; there the old Cabbage Roses flower profusely and load the air with the sweetest perfume; and Moss Roses, pink and white, forgotten in many a garden, perfect their exquisite buds. *Solanum jasminoides* is a common climber on many cottages in the south-west, and there is no doubt that in a warm district it is the finest of all flowering climbers, since it often starts into bloom in the month of April, increasing in beauty until September, and often carrying flowers until Christmastide.

The *Wistaria*, with its great drooping, lavender clusters, is a special favorite, and may often be seen garlanding cottage walls. The author of "The English Flower Garden" never penned a truer sentence than when he wrote: "Among the things made by man nothing is prettier than an English cottage garden." There is rarely much bare earth in a cottage garden. The size of the plots is too small to permit of any ground being wasted, and thus everywhere the brown earth is covered with flowers and foliage, which is as it should be in all gardens, but too rarely is. Nowhere do the



Courtesy of *Gardening Illustrated* (English).

An English Thatched Roof Cottage, Covered With Vines and Climbers. Note the Attractive Cottage Garden in the Foreground.

lovely *Madonna Lilies* grow in such unsullied chasteness and graceful vigor as in cottage gardens, though apparently but little thought is given to their cultural requirements, and one can only surmise that the clue to their unfailing health and beauty is to be found in Ruskin's words: "Flowers only rightly flourish in the gardens of those who love them." Cottagers show their taste in the appreciation of fragrance, and many of their gardens are filled with sweet odors through the long summer twilight. Great *Lilac*-bushes, with their wealth of perfumed flower-spikes, often overtop the low, thatched eaves, while by the village road the yellow-tasselled *Laburnum* hangs its shower of gold.—*Gardening Illustrated*. (English.)

The Month's Work in the Greenhouse

HENRY GIBSON

JANUARY is a busy month in the greenhouse, there are many preparations to make for the coming season, and in some cases work that was left over from last fall may be taken up.

English daisies, pansies and forget-me-nots, omitted from fall sowing, may still be sown if done at once, so as to have nice sized stock to plant out in the spring.

Plans for next summer's bedding should be outlined and an estimate made of the number and kind of plants needed, so that propagation may begin at once. Old stock plants of geraniums should be placed on a bench in a light position and spaced out so that they will give a crop of cuttings. Such plants as fuchsias, heliotrope, stevias, coleus, alternanthera, etc., should be propagated forthwith.

The new catalogues from the seedsmen are now coming in, and no time should be lost in getting such seeds as *Linca rosca*, and its varieties, sown. They need a warm, sunny house to get them to flowering size by bedding-out time, and would be more likely to attain this were they sown in December. Begonias of the luminosa type, pentstemons for bedding, aquilegias, snapdragons, shasta daisies, and many other seeds may be sown this month.

Hardy phlox and larkspurs, lifted last fall and wintered in flats in a cold frame, may be placed in a carnation house temperature, where in a few weeks they will furnish fine cuttings.

Canterbury bells, wallflowers and coreopsis, the last named lifted from the borders last fall may be brought into a cool house towards the end of the month, where they will furnish a supply of flowers that will be much appreciated in the early spring months.

The supply of flats for pricking off seedlings should be gone over, and needed repairs made.

Roses of the rambler type intended for use round the Easter holidays should be brought in from the cold frames or pits where they have wintered, top-dressed, with good loam and bone meal and placed in a violet house temperature. As they show signs of swelling the buds they may be given more heat, and as they continue to advance still more until they are in a temperature of 60 degrees at night, which should be the maximum if strong, vigorous plants free from mildew are wanted.

Hydrangeas may be got under way towards the middle of the month. They need about 45 degrees to start, advancing by degrees to 50 and then to 55. When needed for house decorations almost all of the French types, as well as the old timers, such as Otaksa and Dr. Hogg, are better for having a week or ten days of cool house treatment after having flowered before being taken into the dwelling house. Hydrangeas while undergoing forcing like plenty of water, but one should not overlook giving too much. They soon show their resentment of wet feet continuously, by yellow leaves, which never add anything towards enhancing the beauty of the plants.

Giganteum lilies will now be from three to four inches high, and should be kept growing steadily in a temperature of 60 degrees. Watering should be done with care, and the plants should be fumigated frequently to keep them clear of green aphids, which are very partial to them. Cold storage lilies may still be planted for use at the Easter festival, as they can be flowered in twelve weeks,

but between now and April 4, which is Easter day this year, there is not much time to be lost.

Some care is necessary in handling cold storage lily bulbs, particularly with regard to watering, keeping them too wet is apt to result in premature top growth without roots, which must inevitably spell failure to the plants. A low temperature is not likely to offset any careless watering. Keep the bulbs at the outset rather on the dry side, after the pots have had one thorough watering, which together with a fair proportion of sand in the potting soil will help them get a start, under the bench in a carnation house temperature.

Leeks and onions may be sown in the greenhouse for exhibition purposes. Cabbage, cauliflower and lettuce may be sown this month to be later transplanted to hot-beds.

Rhubarb, asparagus, seakale and chickory should be taken in for forcing. The last named forces well under a carnation house bench. Successions of each may be made to maintain a regular supply during the early spring months.

A little time among the palms, ferns and stove plants will be profitably spent, as many of these will as likely as not be infested with either scale, mealy bug or red spider, all more or less numerous. These parasites suck the energy out of the plants in a very short time unless checked. Many palms will need topdressing, or repotting, and when this is done, given heat and plenty of water, will start out with renewed vigor and develop into fine specimens.

Those who are not fortunate enough to have a greenhouse whereby they may satisfy their winter of discontent during the cold days of January will find plenty of interest in taxing their ingenuity preparing for the season's flowers and vegetables in spite of the lack of greenhouse space in which to start the plants. The average dwelling house is more often than not heated to 70 degrees, ample heat to start the supply of seeds at home. It lacks the humidity and freedom from draughts and the direct sunlight of the greenhouse, yet withal much may be made of home conditions for raising seedling plants. A little study will soon enable the more enthusiastic to get together an arrangement which will enable one to start seeds in close proximity to the stove, or radiators, without having the receptacles in which they are sown come in close contact with the source of heat so as to dry out the soil unduly.

Covering the boxes or pots of seeds with a pane of glass will help to prevent too rapid evaporation from the surface. Watering of the receptacles should be done by immersing them in a dish of water so that the water may travel upwards through the soil thereby saturating the whole body of it, and also prevent washing out the seeds as is too often the case when water is applied from the surface.

Seedlings started in this way may be transferred to a hot bed located on the south side of the house, and which may be heated by having a cellar window open into it, thus utilizing the heat from the furnace. One can readily arrange this by placing the frame against the window and cutting an opening in the back to admit the warm air from the cellar window.

The Month's Work in the Garden

JOHN JOHNSON

THE writer extends New Year's Greetings to readers of the CHRONICLE. May this year bring with it increased success, and may the many who have hitherto been denied the pleasures of a garden find opportunity for the development of their æsthetic talents by cultivating gardens during 1920.

All who have made gardening their life work appreciate the advantages of a good start. They realize that it is not too early during January to lay their plans for the year. The importance of this early start is not, however, always appreciated by the amateur or small grower. As soon as the catalogues arrive begin in earnest to prepare the seed order. Exercise careful thought in its preparation that everything be included to meet all demands for the season, and further, order from the most dependable source. Our leading seedsmen adopt every conceivable means of preserving the productive power of the seeds they handle and it is a matter of ordinary wisdom on the part of garden lovers to patronize reputable seed firms in preference to the general monger who displays his seed wares in cheap gaudy packages. The aim should always be to place an order with a view to getting the best, for none but seeds of high germinative quality will produce sturdy vigorous stock, no matter how much care is expended later in the plants' life.

We have always advocated the annual testing of varieties listed as novelties, and yet to never discard a variety of proven worth until something better really warrants its displacement: See that the supply of tools, insecticides and other sundries is replete to avoid disappointment when anything in this line is actually wanted.

The work of the month in the average garden must be regulated largely according to weather conditions. Orchard pruning should be done whenever possible and spraying operations must take a similar course. Methods of pruning are indeed variable but it is safe to say that the old practice of wholesale "heading in" is fast falling into disrepute. The greater freedom of growth now permitted by fruit growers not only results in a more fruitful tree in the early stages but the tree itself attains greater dimensions in a young state. The great aim in pruning should be to control and maintain a proper balance of growth. Admit sun and air by thinning out the top growth. Cut out interfering and cross branches and weed imperfect wood. Thus the tree is rendered accessible for spraying and fruit picking. If large branches must be removed smear the wounds with tar, or lead paint to prevent decay. In old orchards it is often necessary to scrape the loose rough bark off the trees to eradicate insect and fungoid pests. This of course should be done before spraying. However, in orchards which have been sprayed annually and otherwise given the required attention, scraping becomes unnecessary. Young trees sometimes suffer injury by the gnawing of rabbits. If the trunks of the trees are likely to be girdled take preventive measures by wrapping the lower portion with tar paper or other protective material.

Spraying may be done any time during the winter season except when the weather is actually freezing, therefore, select a still day during a mild period for doing the work. Lime and sulphur is a popular and effective spray, and the miscible oils are also much in demand. If attempted, spraying should be done thoroughly.

Clear snow and ice away from gutters on drives and garden paths to prevent erosion during thaws. Shake newly fallen snow from specimen evergreens to prevent damage, and keep frames clear of snow unless the stock is in a dormant and frozen condition. Ample protection must be given frames in which lettuce, endive and parsley are growing. Uncover the sash whenever weather permits and admit air. Remove decaying foliage and stir the surface soil to keep it sweet and fresh.

Commence the propagation of bedding stock as heliotrope, verbenas, alternanthera, geranium, pentstemon and any other kinds required in quantity. Seeds may be sown of such kinds of *Trachelium rosea*, tuberous begonias, canna and others of slow growth. These require a temperature of 60° to 65° to assure good germination and should be sown in a light porous compost. Many of the hardly perennials if sown in heat at this time will flower the first season. Hollyhocks succeed well treated in this way particularly in gardens where rust is troublesome. In the case of these plants it is well to remember that a large amount of growth must be produced within a short time so that the treatment afforded them should be generous throughout.

Cabbage, Cauliflower, and lettuce may be sown in gentle heat for later transplanting in frames to furnish early supplies, and now is the time to sow onions and leeks of the exhibition type. Tomatoes never come to the table too early in the season and where space can be given a few plants under glass can be grown in almost any fashion to suit the convenience of the grower. A compost of loam, leaf-mould and sand is suitable for seed sowing and a temperature not lower than 60° should be afforded if possible. An early variety of potatoes may be started in pots where room can be afforded, although it hardly pays to bother with this crop under glass since Southern grown potatoes find ready sale in our Northern markets early in the season. Grown in pots potatoes require a light rich soil.

Sharpen pea brush and poles for beans. Tie the brush in bundles and put them together in various sizes so as to have them ready for use at the proper time. Do everything now which might be calculated to lessen the pressure of work later on.

Survey the home grounds to find out what might be done to improve the winter effect. Some shrubs are especially beautiful during the winter with their snow laden twigs hanging in graceful tracery, and many too even at this late date are resplendent with lingering red berries. Among the kinds suitable for massing along the boundary line are the Spiræas, Red-twigged Dogwood, Berberis, *Rosa rugosa*, and Scarlet Thorn. Low growing hardy evergreens always give to the foundation of buildings a cheerful appearance, and of these there is a wealth of material upon which to draw. *Kalmia latifolia*, *Rhododendron maxima*, *Andromeda* in variety, *Mahonia aquifolium*, and *Cotoneaster* in variety. In addition to the foregoing there are numerous dwarf conifers as: *Taxus cuspidata*, *Juniperus sabina*, *Picea excelsa pumila*, *Pinus montana* *Mughus* and *Retinospora filifera*. Actual planting cannot be done at this time, but in this as in other matters be ready.

The Resting Period of Plants

NO matter how successfully summer flowering bulbous and tuberous-rooted plants may have been grown, or what their appearance during summer may be, this is no criterion of the grower's ability to grow them to perfection, unless he is capable of doing this every year. It is a more difficult matter to successfully store away the bulbs and tubers and to care for them over winter than to grow them. This may be proven by the large numbers that die during the winter resting period. Therefore to successfully bring them through the winter is really the criterion of ability in the culture of these subjects.

Many forget that bulbs and tubers live during the resting period as during summer. The difference is that they are not visibly growing, though actually they are. Even in dormancy certain essential changes take place, the only difference being that vitality is reduced. This resting may be likened to the sleep of a person. Surely by no stretch of the imagination can we regard a person in this state as dead. Once the grower of bulbous and tuberous-rooted plants becomes impressed with the idea that he is not handling dead, worthless things, he will give them proper living conditions even during winter, when it is necessary for them to rest or "sleep."

Another important thing we are apt to forget is that the summer flowering bulbous and tuberous-rooted plants we store away during winter are all, or nearly all, tender exotics, and, therefore, not being hardy they cannot stand the low winter temperatures, as do our native plants.

The two important things then to bear in mind are, that bulbs and tubers during their winter's rest are alive, though dormant, and that the reason we store them away is that they are too tender to withstand low temperatures, or that other outside conditions are unfavorable for their preservation over winter.

Bulbous and tuberous-rooted plants vary greatly in their requirements even during their "sleeping" period. They must have a certain temperature, a certain condition of atmospheric humidity, and in some cases a certain condition of the soil or other medium in which of necessity they must be stored. It is not sufficient merely to throw the subjects into a box or shed.

A certain temperature is necessary for all plants to live. Tropical or sub-tropical plants require a greater degree of heat during their growing and resting periods than do temperate plants at these respective times. As the temperature falls below normal during the resting period vitality is correspondingly reduced, and if, in the case of tender subjects, the temperature falls very low (even if it does not freeze) and remains so for a considerable time, death may ensue. Perhaps you have known of tubers of cannas, dahlias and elephant's ears (*Caladiums*), tuberous begonias, gloxinias and a host of others which in spring, on removal from storage, were found to be dead, although the temperature did not fall to the freezing mark. All other conditions being right, the tubers died because the temperature was too low over a prolonged period to allow the plants to live. The metabolic process, that, briefly, being the chemical change necessary to the life of the plant, could not take place at the low temperature.

Just as the temperature may be too low, so it may be too high for bulbous and tuberous rooted plants during the winter resting period. A person cannot sleep or rest in a temperature which approaches the heat of his blood. This unnatural condition excites and produces a state of restlessness which cannot be overcome

until the temperature is lowered; so it is with the cannas and other bulbous and tuberous plants. A high temperature will excite the metabolism and growth will commence at an unnatural time, with consequent injury to the subjects. From these remarks, it will be seen that somewhere between the extremes of heat and cold there is a temperature just right for the welfare of our subjects when they are in a state of rest.

Some bulbous and tuberous rooted plants require a dry atmosphere in their storage place, others a normal one. Bulbs or tubers of a firm texture like the gladioli and tuberous begonia require the former, while tubers of a succulent nature like the dahlia, canna, elephant's ear, and gloxinia require the latter. Were the last mentioned subjects stored away in a room with a very dry atmosphere, their cells would quickly lose their moisture, the cell walls would collapse, and the tubers would shrivel and become useless. Such is a very common occurrence, though easy to obviate.

Were it possible to have the atmosphere just right, and just sufficient moisture therein, it would not be necessary to store many subjects in soil, sand, or other material. In all cases, however, where the atmosphere is very dry, it is the safest practice to cover the bulbs or tubers with some material to prevent the excessive escape of moisture from their cells. Generally sand will be found excellent for the purpose, but in no case should the crowns of the tubers be buried, or bulbs be covered to a great depth. It should not be forgotten that it may be necessary to occasionally water cannas, caladiums and dahlias in a dry position, even when covered with sand, and if the crowns are below the surface water will penetrate and cause the tubers to rot. Watering should not be done in any case as long as the tubers are plump and hard, but as soon as the first signs of shrivelling occur, delay in this respect will be dangerous.—*The Canadian Florist*.

PLEASURE PLUS PROFIT IN PLANTING

IN the furnishing of our homes we are guided by at least three main aims: Beauty, comfort and material utility. Each is as important as the other in the perfect enjoyment of the home life.

The same objects should guide us in the planting of the home grounds. Not often enough is there found a perfect balance of these three, for in the furnishing of the garden the question of space and individual likes and dislikes play an important part. Sentiment and the love of the beautiful are, perhaps, the strongest motives that urge most people to plant the things which, from a purely economic viewpoint, are more lovely than useful. This is indeed fortunate and perhaps a wise provision after all, for the garden thus is enabled to exert a powerful uplifting influence. Moreover, if we were to strip horticulture of sentiment, our business would soon go to the bow-wows. We need never fear, however, that such a thing will ever happen, since it is an inherent quality of the human race to take a keen delight in all things that grow out of the earth.

There is another class of people who spend lavishly on ornamental planting, not alone for the love they have for flowers and plants, but for the pleasure it affords them to know that they have the best furnished grounds in their immediate circle. To receive the praise of the visitor or guest is a sweeter reward than the pleasure they derive from the plantings on which they have spent almost fabulous sums.

Still another phase of the matter, and one which affects almost all garden owners, is the question of the selection of plants which will give both pleasure and profit to the owner, in other words, plants which are useful as well as ornamental. Our enjoyment of the garden will not be diminished, but rather increased, by having plants that serve a twofold purpose. The Cherry, the Apple or the Pear will often be equally as desirable ornamentally as a Norway Maple and will give ten times as much beauty and service as a greedy Carolina Poplar. The Crab Apple, Peach and Quince are delightful in floral display and often might fill many a position now held by some fleeting beauty whose fruits previously mentioned are with us to be enjoyed by all the senses.

Much more planting of fruit trees would be done were it not for the annoyance of having young people without

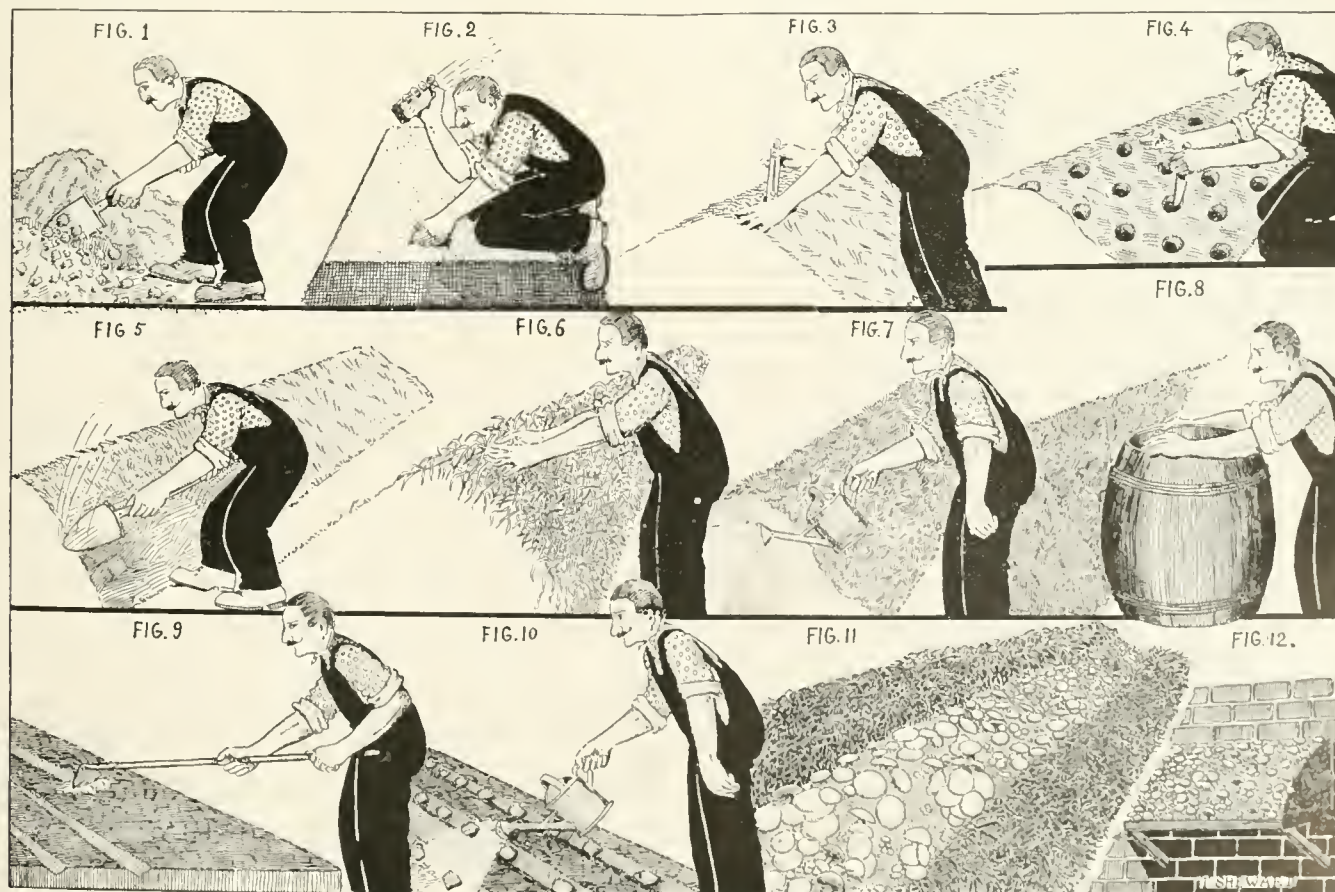
proper respect for the rights of others appropriating for themselves the fruit that rightfully belongs to the owner of the trees. The restraining hand of the law fails to hold under subjection that impulse to steal. Respect for the property of others and a correct understanding of what true liberty means must come as the result of the child's early training. However, were fruit trees more commonly seen in gardens perhaps there would be less notice taken of them and thus the desire to take the fruit would not be so strong.

Now that "old H. C. L." is such a persistent guest in every home there seems every reason for the planting of such things as will, in some measure, offset his sapping influence and bring real enjoyment to the greatest number of our people.—EDWIN MATTHEWS in *Florists' Exchange*.

Mushroom Culture

OF the several kinds of edible fungus the Mushroom *Agaricus campestris* is the best known and has been used as food for 2,000 years. Like all fungi, this thrives in dark places and is grown in France in caves under ground. Special houses are devoted to mushrooms, also grown as a side crop under greenhouse benches. A dark cellar that can be kept about 57° would be an ideal place for growing mushrooms. The temperature could be controlled by placing barrels of fermenting manure in the cellar replacing these as needed (Fig. 8). The temperature should not be allowed to fall below 45° and after spawning, care should be taken not to get the beds too wet by giving only a light sprinkle with tepid water if the soil looks dry (Fig. 7). To grow mushrooms, it is most important to secure good spawn. In making the beds procure fresh horse manure and mix with it $\frac{1}{3}$ its bulk of

fresh loam (Fig. 1). Turn this daily to prevent overheating and when sufficient quantity is secured to make the bed, put it in the cellar or mushroom-house. In making the bed ram down the manure firmly (Fig. 2) and when finished place a hotbed thermometer into it. When the temperature of the bed declines to 90° it is safe to spawn, (Fig. 3). Break up the spawn and plant into the bed about 1 foot apart and 4 inches deep, (Fig. 4). In a week or 10 days, when the spawn has spread through the bed, cover with 2 inches of fresh loam and press down smooth and even, (Fig. 5). Afterwards cover with straw, (Fig. 6). After spawning the temperature should be kept as near 57° as possible and cold draughts should be avoided by constant watchfulness. The mushrooms should appear in 5 or 6 weeks after spawning.



Common Sense in Painting Greenhouses

JAY D. EARLMAN

A CERTAIN friend of mine has a hobby, it is his greenhouse. And unlike some greenhouse owners, he didn't build it as a material evidence of his prosperity. In fact, from one or two remarks he made, I think he had to scrape a bit to indulge himself, but he bought it because he loves flowers and all manner of growing things.

This friend of mine is a successful business man, and a thrifty one. Although he devotes a great amount of attention to the greenhouse and its stock of growing things, he attempts to operate it on a business basis—as economically as possible.

I use the words "attempts" because I think he is inconsistent; specially referring to the question of painting that greenhouse.

In spite of the fact that as far back as a half a century ago it was proved that ready-mixed paint is far superior to the old-fashioned hand-mixed variety, some folks just can't seem to see the light.

And so, because Charley Burson is a friend of mine, I just naturally sat down beside him the other evening and told him where he is not only behind the times, but throwing away good money besides. Am not sure, but believe he now understands. The following, in substance, is what I told him:

In the first place, the one great outstanding mark of superiority of the machine-mixed paint over the hand-mixed lead and oil, is found in the mixing itself. The modern mixing machines found in a modern paint factory can in a short time mix the necessary paint-producing ingredients in a manner that never has been and never will be approached by the old-school painter with his stirring paddle and his good right arm.

Properly mixed paint means paint that has a film of linseed oil wrapped completely around each pigment particle, which film will protect that pigment from the action of the destroying elements and at the same time bind it together with its fellow pigment particles. Hand-mixing cannot accomplish this.

One great trouble experienced by the man who attempts to mix his own paint is that of obtaining a mixture of the proper consistency. Suppose, for example, he starts out with three gallons of oil and a quantity of white lead. He mixes the two together and begins the stirring operation. He needs more lead, so he puts it in, and continues stirring. More lead is needed, so he adds it—generally adding a little too much—making his mixture too thick.

This means he must add more oil, which he does. Ten to one he adds a little too much oil, which necessitates the addition of more pigment to obtain a proper working mixture.

And not only amateurs, but many journeymen painters, as well, have in this manner mixed from one to two gallons more paint than was necessary for the job. Of course, the property owner paid for the waste.

So much for the higher cost of lead and oil.

Next, consider the results that are expected—yes, expected. It should be borne in mind that if about 30 per cent of zinc is not added to the pigment, the first coat of lead and oil will soon chalk off. I don't say it is liable to chalk off, I say it *will*; and it will do this as soon as the linseed oil has dried, due to the oxygen of the atmosphere acting upon it.

And when the ground coat peels off, the top coat or coats go right along with it.

Now, ready-mixed paint contains all the ingredients that years of paint-making experience have shown to be necessary. Not only contains them, but they have been introduced in just the right proportions and are thoroughly mixed.

Every batch of paint is made according to a fixed formula (usually determined by weight), which means that all preceding and succeeding batches of paint will have the same consistency and workability, and produce the same results.

These formulae enable the paint manufacturer to match colors perfectly, insuring that the batch of paint being made today will be of exactly the same shade as that he made last month, or even last year. The "mix-my-own" painter can only approximate the shades he once produced, because he has no rules or formulae.

Paint manufacturers have used all manner of convincing propaganda during the last half-century to convince painters and property owners that their products are superior to lead and oil, but their one obstacle in putting the idea across universally has been the opposition of the painter himself.

This because the old-time master painter was wont to throw an air of mystery about his mixing operations, which accounts in a measure for some of the older painters holding to the earlier traditions. And while in many cases, a painter will not hesitate to buy a ready-mixed paint if a color is desired, he seems to like hand-mixed lead and oil when painting greenhouses white.

Perhaps this is one reason why so many greenhouses require painting every year.

I recently had occasion to visit a large paint factory in the middle west. On the roof of one of the buildings are a number of large racks, holding in the aggregate, I should say, about four hundred wooden paddles, each painted with a different kind and color of paint. The president of this particular concern is very particular as to the quality of every kind of paint he makes, which accounts for each and every color of each and every kind of paint being tested on this "roof garden."

And this test is a severe one. The paddles are inclined at an angle, similar to the sloping sides of the greenhouse roof, which means that dust, soot, rain and snow will remain on the surface instead of dropping off. This means that these paddles receive unusually drastic exposure, and you can understand from this that an exposure of three years on this roof is equal to an exposure of from six to eight years on the ordinary dwelling.

The painted frame of the greenhouse roof is, of course, exposed to the same conditions, but in addition, the glass panes reflect on the frame an intense heat and highly concentrated light rays, which combine to tear down the paint texture.

The majority of greenhouse owners are today using ready-mixed paint for two reasons: it looks better and it lasts longer.

A third reason is that it costs less. True, the best ready-mixed paint costs more per gallon, but it always costs less per job because it spreads out further and covers better.

The greenhouse painted with hand-mixed lead and oil has to be painted every year. When painted with the best grade of manufactured paint it will not require painting for three years.

A Lesson on Soil Formation and Its Bacteria

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

IN choosing subjects to be dealt with in this department, our aim has been to select those having some special connection with the work of the particular month in which each appears. However, as at this time there is little connected with gardening outside which can be called seasonable, it appears that this is a fitting period to spend a little while at the Fireside University and to go somewhat deeper into the whys and wherefores of matters which have previously been given merely a passing glance.

We believe that gardeners, whether professional or amateur—and we are glad to know that there are a continually increasing number of the latter who read this journal—will always find that the more they know of the complex processes which are going on in the soil and in the plant, and the more they know of *why* certain requirements are necessary to produce the highest results, the more interesting the work will be and the more pleasure they will derive in carrying it out.

Subjects connected with the soil and plant life are so co-related and so inextricably interwoven that it is a practical impossibility to avoid at all times some repetition in dealing with the various seasonable phases to which they refer.

SOIL POPULATION, BOTH GOOD AND EVIL.

The soil, and the spectacle of a living plant growing and building itself up from it, was the theme of some interesting stories, both in prose and verse, written by the most learned philosophers who lived several hundred years before the Christian era, and from their writings we gather that our practice today is, broadly speaking, very little, and in some ways not at all, farther advanced than it was then. But we today know something about the whys and wherefores of which in those ancient times nothing was known. About the first discovery relating to causes was made at the beginning of the nineteenth century by the application of analytical chemistry to both the soil and the plant, but the most momentous and far-reaching step along these lines was made only some twenty-five years ago when the first knowledge of the work of bacteria in connection with plant growth was gained. This discovery opened up a vast unexplored region, the boundaries of which have not been reached, nor are they in sight.

Today we know that *soils* are peopled by myriads of micro-organisms containing numerous distinct species, each species carrying on its appointed work, which causes the soil to be more suitable, or less suitable, according to the nature of the work, for plant life. It has been estimated that in a grain of average soil there are from sixty thousand to five hundred thousand beneficial and injurious bacteria. (In case any reader should not be aware of the fact, it may be mentioned that a gram equals 15.432 grains avoirdupois.)

This tremendous soil population is always busy. Among them division of labor is the rule, and it has been found that certain species of bacteria are specialists along certain lines and along these only; they carry out their special work which may be changing organic matter which is in a condition that is unavailable for the plant, into one which is available. One species specializes in making the initial change, when the work is taken up

by another species which carries it along a step farther; then a third takes it in hand, and so on, until the stage is reached when the result of the process is perhaps an ingredient that the plant will find suitable for its consumption; or the result may be something inimical to plant life, either in the way of active poison to it, or poisonous and directly destructive to those beneficial bacteria upon which the plant demands more or less for its existence; and in either case it is generally, but not always, a substance which cannot be carried to any other stage.

It will be apparent therefore that the population of the soil is composed of both good and evil, working along lines similar to those followed by the human population of the earth's surface. Among the latter a number are working in various ways directly or indirectly connected with productive industry; while others are at the same time busy creating poisonous influences along the lines of destruction to industry and destruction to the beneficial workers. Various points in the more advanced practice of gardeners and farmers (which will be touched upon later on) are being increasingly devoted to preventing the work of the harmful soil population both by bringing about their actual destruction, as well as by using means to foster, strengthen, and encourage the growth and multiplication of those members of the soil population which are beneficial.

THE MATERIALS THAT COMPOSE THE SOIL.

Before dealing somewhat more fully with the work of these bacteria and showing why certain operations in gardening are based upon the idea of creating conditions suitable for those which work for the good of the plant, it appears fitting that we should first consider very briefly some points connected with the making of soil, a word which was italicised above for the purpose of emphasizing the fact that material composing the earth's surface cannot always be designated soil.

The beginning of soil formation goes back to remote ages when the particles of sand, grit or clay got split or ground off the rocks and began their wanderings by water, wind, or glacier that have finally deposited them in their present place. Many of their chemical and mechanical properties were determined by the original rock and also during these wanderings by mixture with debris from other rocks, thereby creating differences which have persisted through many ages, and we cannot go back and undo the work of the past. But the mineral particles do not constitute the soil, although they average ninety-five per cent of it. The final stage in soil formation is not complete until vegetation has sprung up and died, and its remains have mingled with the mineral fragments and decayed. During its lifetime vegetation takes certain substances from the mineral or inorganic matter and the atmosphere, and builds them up into complex organic matter. Like other constructive work, this process requires energy, which in this case is derived from the sunlight and is stored up in the complex substances of the cell tissues of the plants.

When the plant dies and its remains mingle with the mineral fragments, it begins to decay. The whole process then reverses; instead of a building up there is a breaking down; the fabric of complex material slowly elaborated during life, is disintegrated and resolved into

the simple substances out of which it was formed, and, with an exception, all the stored up energy is dissipated. The old life becomes cleared away and the ground is left clear for new life; the old plant tissues are converted into food for another generation of plants, and the process of dissolution and decay affords the means whereby more life may manifest itself. Gradually a whole population of the most varied description springs up in the soil, feeding on those plant tissues, deriving its energy for the most part from the energy stored up during the lifetime of the plant; and reversing completely the changes effected by the plant.

The above mentioned exception to the dissipation of energy is seen in the case of coal in which little, if any, more than the initial stage of decay has been reached; the only change being that the plants composing it have lost their green color, while the energy which they absorbed from the sun during their life has been stored up for the use of the human race in the various processes of our very complex modern existence.

A complete cycle of changes is continually taking place between the soil and the plant. Starting with certain simple materials, the structureless substance in the plant cells, known as protoplasm, builds up complex plant substances, fixing the sun's energy by means of the transformer situated in the leaves, called chlorophyll; this is the constructive part of the cycle. When a plant dies and its material is returned to the soil the other part of the cycle, the destructive change, begins; the complex substances are broken down and are resolved finally into the simple substances with which the change began. The soil is the medium in which this second part of the great cycle of life goes on. It is so bound up with the cycle that one cannot think of it apart from the changes occurring within. This is the great distinguishing feature of the soil, marking it off sharply from a mere heap of mineral matter.

PROCESSES INVOLVED IN FORMATION OF SOIL.

Some of the processes involved in the formation of soil can be observed where any great masses of earth are thrown up from below the surface and allowed to remain, or in the case of landslips from cliffs or mountain sides, in all of these we have a heap of virgin mineral matter. For many years this will be bare of vegetation although we may be sure that plant seeds will have been blown in upon it, or carried by birds. But in the course of time minute and insignificant plants will begin to appear which will be found to be of an entirely different character from those prevailing upon the surrounding land; until conditions are brought about which will render the more prevalent local type of flora possible.

The great interest now being shown in soil formation and the many practical lessons probably to be learned have induced some Experimental Stations to form permanent beds of raw virgin earth dug up from beneath the surface and they have commenced systematic botanical, bacteriological and chemical observations of the natural changes taking place, and in other ways studying Nature's methods connected with it. But Nature never hurries, and the process of soil making is very slow under natural conditions.

The question now arises, and it is a vitally important one—Can we control the process of soil making and intensify those processes taking place within it that are beneficial to plant life?

Our next step will be to discuss ways to these ends and why certain methods of handling the soil are likely to bring it about.

THE PROCESS OF SOIL MAKING.

As regards the mineral matter of the soil, it, from the point of view of ordinary practise, lies in the main outside our control. It is true that in Europe for many centuries something was done in special cases in this direction—especially in Belgium and Denmark up to just before the war—by adding clay to very sandy soils and also sand to soils which required to be made lighter. But in these days this work is too expensive to be practicable in the case of those making a living out of the land, and further, gardeners and farmers have for the most part learned how to manage soils of different types; they have evolved systems and methods suitable to sandy soils, to loams and to clays; the mechanical textures of the types which are extreme in either direction can be easily and inexpensively modified by green manuring, and the mineral constituents can be added in a concentrated form which was not possible before the age of chemical fertilizers.

At the same time, upon a small scale, in a garden where results are more important than expense much can be done. For instance, one may have a sandy soil and wishes to improve it for the purpose of making it better suited for the purpose of growing roses; in this case the addition of clay is indicated, by which means the sandy soil can be changed into a loam.

It is now known that our efforts should be directed to increasing the organic matter of the soil, this is much more easily under our command, and it is in this direction that control of soil making and improvement principally lies. This is readily and cheaply effected, as above mentioned, by the turning under of green crops, a point of practise which was discussed in the October issue.

There is another factor in soil making which can also be controlled—the securing of conditions necessary for the decomposition of organic matter, as there seems to be no getting away from the fact that the nutrition of plants in the soil is primarily bound up with the decomposition of plant and animal residues. In their original state when first put into the soil these residues are not only valueless, but are even harmful, to the plant, it is only after decomposition that they begin to be valuable. Therefore the speed and completeness of the decomposition are of great importance in soil fertility.

The work of decomposition is entirely carried on by living organisms, and although larger species, like earthworms, assist in the dissemination of the material, the change is practically begun and completed by bacteria. These soil organisms will do their work thoroughly if given a chance; the object of the gardener should be to see that they get their chance.

ESSENTIAL SUBSTANCES OF THE SOIL.

In these days when science has invaded the kitchen and scientific dietary is more or less studied by housekeepers, the fact that the more important components of both meat and vegetables are protein, carbohydrates, fat, cellulose and mineral matter, is not unknown. All these substances were originally formed by the plant from material contained in its food which it derived from the soil and, in the case of meat, were conveyed to the animal through the food the latter consumed. These substances are all of a complex nature, and in whatever form they are returned to the soil, whether in that of animal manure, bones, vegetable matter, and such like, all the complex substances have to be resolved during decay into the simple substances which the plant took from the soil in building them up. Each of the complex substances is not only attacked by a special species of bacteria which has no power of acting upon any other substance, but the various stages of decomposition

through which a particular substance has to pass are each of them handled by a separate organism which cannot perform upon any other stage but its own.

Space will not permit any attempt to trace bacterial work in connection with all the above compounds, and moreover all of it is not yet known; but with regard to protein, bacterial action is fairly well understood and many of the species specializing in this connection have been isolated and cultivated in the laboratory, and named.

Protein is the most complex compound entering into plant structure, so much so that definite formulas have not yet been applied to it, although chemists are well acquainted with its chemical composition. While protein is known as a nitrogenous compound it rarely contains more than twenty per cent of nitrogen. The fact connected with the work of bacteria which specialize upon nitrogen are more fully known than they are in connection with other things, as these nitrifying bacteria have been studied for a great number of years being the first which was discovered. The importance of nitrogen is further emphasized by the fact that it is never part of the original disintegrated rock which is the basis of the soil. Nitrogen is also the most expensive article of plant food to purchase, and it is also the one which is the least easy to retain in the soil.

The decomposition of the organic nitrogen contained in protein involves several processes; ammonium compounds are first produced which take at least two stages, each of which is under the charge of a distinct species of organism. These compounds are then seized upon by others and turned into nitrites which are changed by still different ones into nitrates. It is only in the latter form that soil nitrogen is available. The last two changes are accomplished very quickly, which is fortunate, as when ammonia or nitrates are in contact with the roots of plants for any length of time, harm may result.

The artificial application of nitrate to the soil is generally in the form of nitrate of soda, and its availability is shown by the quickness of its effects: although when a plant is obtaining from the soil all the nitrogen it requires it is possible to apply nitrates without producing any appreciable result, and in this case the application may, to a great extent, be looked upon as waste.

Another set of nitrifying bacteria have the power of fixing the free, or gaseous, nitrogen existing in the soil, on their own account.

The fixing of free nitrogen from the atmosphere is greatly intensified when a leguminous crop is grown. If we pull up a root of clover, peas, or beans, we find little nodules present, which, when examined under the microscope, are seen to contain numerous bacteria. These organisms are busily at work seizing nitrogen from the air and building it up with compounds of use both to themselves and to the plant. The necessary energy comes not from decaying plant residues as is the case with other bacteria, but from the juices of the living plant; the organism is a parasite living upon its host, but it is one of the few parasites that gives more than it takes.

All the various bacteria require food to build up the energy necessary to carry on their work. With the exception of those inhabiting the root nodules, they get their food out of the soil which they obtain principally from decomposed plant residues, although there is no doubt they can to some extent make use of food, such as phosphates, etc., having a direct mineral origin.

In addition to food, these bacteria require an ample supply of oxygen, although in the case of one species it appears that it can work in the absence of this gas, or at all events can do with much less than the others.

THE STERILIZING EFFECT OF RAIN.

From time immemorial practical men have felt that rain had a fertilizing effect. Ancient and mediæval writers attributed this effect to some aerial spirit or celestial nitre washed down. Leibig put it down to ammonia. But since Liebig's statement, vast numbers of analyses have been made of rain from all parts of the world, and all agree in proving that there is not enough ammonia or anything else in rain to make any difference. Everyone is, however, aware of the great benefit of rain: of what a brilliant green the lawn puts on immediately after it, although a day or two before it may have been parched from drought and of a brown color. That the beneficial effect of rain is due to something more than the actual water supplied is well shown by the fact that no amount of artificial watering will do as much good. What then is the cause of the marked effect of rain?

During some soil investigations it was discovered that soil possesses two atmospheres: one the free atmosphere in the soil spaces, and another atmosphere dissolved in the moisture contained in the soil particles. This free atmosphere is much like our own, except that it contains more carbon-dioxide and it is eminently suited to soil organisms. The dissolved atmosphere is, however, entirely different inasmuch as it is almost entirely devoid of oxygen, especially in dry weather, and consists mainly of carbon dioxide and nitrogen. The fact that it exists in such close proximity to the free atmosphere indicates that the oxygen is used up more rapidly than it is renewed, and this shows that the plant roots and micro-organisms are more or less constantly in need of more oxygen. So far as is known there is no process in the soil that will hurry up this renewal of dissolved oxygen, and plants and bacteria are, in its absence, restricted in growth by the lack of it.

Rain is practically a saturated solution of oxygen, and when it falls upon the soil it not only supplies water, but also renews the stock of dissolved oxygen, and thus gives the plants and the micro-organisms a new lease of activity.

The great value of maintaining a plentiful supply of oxygen is one of the reasons why keeping the soil well aerated by frequent cultivation between plants does so much good. When a hard crust is allowed to exist the work of bacteria is greatly checked, and in a compacted soil their activities are almost brought to a standstill. Also soil in this condition allows water to evaporate very quickly and plants suffer from drought sooner than if the surface of the soil is kept loose.

PREVENTATIVE FOR CAUSES HARMFUL TO SOIL.

On the other hand bacteria cannot carry on their work in a soil that is continually wet and water-logged, besides which such a condition prevents plants developing root action. Hence the necessity for subsoil drainage where such does not naturally exist.

While for many reasons a plentiful supply of humus is a necessary condition of fertility, this humus is the cause of soils becoming acid; the acidity is detrimental to the beneficial soil population, especially those engaged in nitrification, and at the same time it acts favorably in assisting the growth and multiplication of those organisms which work harm.

To prevent soil acidity lime must be added, and its addition to the soil is also required because most of the beneficial bacteria cannot exist without it, apart from any question of acidity. In a previous article I pointed out other ways in which lime is valuable in forming a fertile soil, and it was then stated that either carbonate of lime (ground limestone), or oxide of lime (quick lime) could be used, as it has been for a long time supposed that both

acted practically in a similar manner, although the action of the oxide is in some respects more rapid. Since that was written, however, Dr. Hutchinson has shown that so far as the soil population is concerned there is a fundamental difference between the two, inasmuch that quick lime acts as a partial sterilizing agent causing a decrease in the numbers of the harmful soil organisms, and following upon this a marked increase in the numbers of the beneficial ones in a degree much greater than results from the application of lime in the form of carbonate. We have previously mentioned in these columns that the harmful bacteria, being larger, are much more easily killed than the good ones and that it is therefore possible to use certain methods of partial sterilization which will not kill the more minute soil population that are of value to the plant.

Another partial sterilizing agent is frost, and this is one of the reasons why the turning up of the soil in late autumn does so much good, because in this way a greater part of the soil is exposed to freezing influence. Still another advantage gained by this practice is that, as the soil population reside for the most part near the surface, when ground is spaded or plowed in the spring just before the seed is sown, we bring up that portion of the soil which has the fewest bacteria and until this new surface becomes populated the young plants do not grow so freely, besides the additional fact that soil turned over before winter works much better in the spring and is mechanically better for quick germination.

PROPERLY PROPORTIONED PLANT FOODS.

Another interesting question has recently been opened up in relation to plant food—and a bacterium is just as much a plant as a cabbage—which it seems worth while to glance at.

It has been for some time known, in connection with animals, that a properly proportioned mixture of pure protein, carbohydrates, fats and mineral substances do not constitute a perfect diet; the animal may keep alive, but it makes little or no growth, in fact it may develop diseases like beri-beri unless some organic food which appears to contain some unknown "accessory substance," such as milk, eggs and raw vegetables, are supplied, and in the case of those human animals whose diet consists mainly of rice the substance appears to be found in the husk of the grain which when eaten entire the disease known as beri-beri is prevented. To this accessory substance the name Vitamine has been given.

There does not appear to be anything far fetched in drawing an analogy in this connection between plants and animals. In fact the necessity for some unknown substance to the growth of plants has been proved in the laboratory by Mazé, who found that while plants made some growth in pure water-culture when supplied with all the mineral salts that their chemical composition showed was necessary, yet nearly ten times as much growth was made when supplied with spring water. Although an analysis of the spring water gave nothing that the plants were not already receiving, yet there is no doubt that this water did contain something vital to the plants' well-being.

There is another point which appears to have a bearing upon this question.

Practical men have for the most part always been of the opinion that stable manure, ground bones, and other fertilizers of an organic nature are of greater value to the plant than chemical or inorganic fertilizers containing the same amount of plant food. Experiments in the field have proved that soil upon which nothing else but inorganic fertilizers are used becomes after a few years practically sterile. Therefore it seems clear that plants

require a mixed diet, and that their food must contain some "accessory substances," call them Vitamines or anything else, in the same way that such are required by animals.

IMPORTANT POINTS TO BEAR IN MIND.

Exigencies of space require us to leave our subject, which we do with reluctance knowing that in this article merely the surface has been scratched, but we hope that enough has been stated to show in some degree why the following points connected with handling the soil should be kept prominently in mind:

Where there is insufficient natural drainage, such should be supplied.

Deep and thorough plowing or spading, to be carried out in late fall as far as possible.

Manure with organic fertilizers rather than with inorganic.

Keep ground between plants continually and thoroughly cultivated for the purpose of aerating the soil and supplying oxygen, and conserving moisture.

Maintain a supply of humus and nitrogen by turning under green crops containing a large proportion of leguminous plants.

Sow cover crops early in the autumn for preventing the unused plant food, especially nitrates, left over by the crops, being lost.

Use lime regularly in small quantities at a time.

It must be remembered that there are no short cuts to fertility. Science does not promise any way of getting round the old injunction "in the sweat of thy face shalt thou eat bread." What science has done, and is doing, is to dignify the gardener's and the farmer's calling by revealing something of the romantic wonders and beauties of the principles involved; it shows how their labor may be better directed as their knowledge of the processes of Nature become fuller and more enlarged.

True Cooperation

What is it to love one's neighbor as one's self? Why, to wish him equal . . . advantages, and character, and to do what is possible to help him secure them. But it takes time to build a man, much more time than to build a house, or a business, as a rule. Wealth alone makes neither superiority, equality, nor inferiority; neither character nor happiness. To pauperize one's neighbor by merely presenting him with the fruits of another's careful thought and hard work is not to love him as one's self. To put him in a position where he can claim what he has no fitness to do, or be, or have, is not to love him truly. To encourage him to magnify the material, as compared with the intellectual and spiritual, is not Christian love. "Cooperation" is indeed a Christian ideal; but such cooperation should be genuine, hearty, not merely technical,—not an enforced, but a voluntary cooperation,—if it is to bear good fruit.

K. P. HARRINGTON.

DO you find the columns of the GARDENERS' CHRONICLE interesting? Certainly you do, or you would not be perusing them. Your gardening neighbor, were he familiar with them, would become equally interested. Why not recommend the GARDENERS' CHRONICLE to him as a guide to his garden work? He would appreciate it—and so would we.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

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D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.

M. C. EBEL, *Secretary*, Madison, N. J.

Trustees for 1920

Peter Duff, Orange, N. J.; William Waite, Rumson, N. J.; Arthur Smith, Elberon, N. J.; Robert Weeks, Cleveland, O.; William H. Griffiths, Detroit, Mich.

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(To serve until 1921)—William N. Craig, Brookline, Mass.; L. P. Jensen, St. Louis, Mo.; William Hertrick, San Gabriel, Cal.; William Gray, Newport, R. I.; G. Hennenhofer, Great Falls, Mont.; Thomas Hatton, New London, Conn.; Albin Martini, Lake Geneva, Wis.; (To serve until 1922)—George Wilson, Lake Forest, Ill.; James Stuart, Mamaroneck, N. Y.; William Kleinheinz, Ogontz, Pa.; John F. Huss, Hartford, Conn.; Edwin Jenkins, Lenox, Mass.; Carl N. Fohn, Colorado Springs, Colo.; Joseph Tansey, Tuxedo Park, N. Y. (To serve until 1923)—Robert Cameron, Ipswich, Mass.; Theodore Wirth, Minneapolis, Minn.; George H. Pring, St. Louis, Mo.; George W. Hess, Washington, D. C.; Daniel J. Coughlin, Locust Valley, L. I.; John Barnet, Sewickley, Pa.; A. C. Jordahn, Palm Beach, Fla.

THE PRESIDENT'S MESSAGE

Fellow Members:—

In expressing my appreciation to you, for the honor which you bestowed on me, by electing me your president at the Cleveland convention last August, I can not but feel the large responsibilities which you thereby placed on my shoulders. I fully realize my limitations of ability and the magnitude of the work before us, and that our success in future advancement will rest, not only on the active work and enthusiasm of myself and those who serve with me officially on the board of directors or on committees, but largely on the individual members of the association.

With proper support from the membership at large financially, and by generous contributions of notes and articles to our official organ, and an active participation of the individual members in the affairs of the association, the year 1920 should, and will be, one of phenomenal advancement for the association and the profession which it represents.

I can not but emphasize the great value of the service bureau to the individual member, and the publicity campaign to the profession at large, but for the success of these undertakings funds must be forthcoming, sufficient for their proper maintenance. As these funds must come from voluntary subscriptions I urgently appeal to every member to do his part, in a way comparable to his means. A comparatively small contribution from each member would result in lasting benefit to the entire profession.

Members should contribute more articles to our official organ, *THE GARDENER'S CHRONICLE*. Not enough is written by the practical man whose personal experiences and observations should be published for the benefit of the craft, short notes on new methods and plants, being of particular value. If sufficient interest is taken in this matter by the members, there will be little need for quotations from other sources. We should make our official organ a national authority on matters pertaining to gardening.

Our association is becoming, year by year, more national in character, and I feel that the selection of the city of St. Louis for the place of holding our 1920 convention was a step forward, not because it happens to be the city of my home, but because it will be a means of adding to our membership roll, the professional gardeners of the Middle West and South, and stimulate the interest and advancement of gardening in this large territory, extending our influence to the Gulf of Mexico. The result of this will be a demand to hold our conventions successively, East, West, Northwest and South, instead as previously in the East. This will not only cause a continued interest in our association and profession throughout the country, but give the members an opportunity to get in touch with their fellow craftsmen of every section of our land, and benefit by an enlargement of observation, obtained under the most favorable circumstances.

In this age of specialization in various branches of gardening, it is of vital importance that we establish a close relation of co-operation with the various allied organizations. Our activities dovetail into each, and all of them in some particular, and the investigations and experimentations of these specialists should be valuable to the all around professional gardener.

The placing of your president on the executive board of the Society of American Florists and Ornamental Horticulturists, should result in a spirit of co-operation, which should be of mutual benefit, and co-operative ties of a similar nature should be established between our association and those of the nurserymen, fruit growers, vegetable growers, landscape architects, seedsmen, arboriculturists, park superintendents, federal and state horticultural organizations and also local gardeners' clubs and societies.

Our field of co-operation should be even broader than this; because of the nature of the occupation of our members it behooves us to assist those who strive for the preservation and protection of our national natural resources, and for the preservation of the scenic beauty of our country. To quote the words of William Morris:

"Tis we ourselves each one of us, who must keep watch and ward over the fairness of the earth and each with his own soul and hand do his due share therein, lest we deliver to our sons a lesser treasure than our fathers left to us."

A partial means of interesting the younger men in our profession may be the active co-operation in the school garden work. This work we should enter not only as an association, but also as individuals. Another is to accept suitable men from the Federal Board of Vocational Education, and to give them all possible encouragement to take up the study of our profession.

I would like, at this time, to add a word for our untiring and efficient secretary, Mr. Martin C. Ebel. Let us demonstrate that we appreciate his great service to the association by showing him our gratification, by a hearty co-operation in the various propositions which he so masterfully conducts from our headquarters in New York City.

The important and intricate problem of a just and fair classification of those desiring to change or better their positions, should be borne in mind by all of us, that a solution of this problem may be presented at our next convention.

The fraternity and the people of the city of St. Louis are looking forward to the pleasure of entertaining you as their guests, and we expect a banner attendance. Do not miss this opportunity.

In conclusion, I wish to state, that my heart and soul is engrossed in the welfare of the association and the advancement of gardening and the gardener. I place myself at your service.

Fraternally yours,

L. P. JENSEN,

President.

PRESIDENT'S APPOINTMENTS

President Jensen has appointed the following directors to serve until 1923: Robert Cameron, Ipswich, Mass.; Theodore Wirth, Minneapolis, Minn.; George H. Pring, St. Louis, Mo.; George W. Hess, Washington, D. C.; Daniel J. Coughlin, Locust Valley, L. I.; John Barnet, Sewickley, Pa.; A. C. Jordan, Palm Beach, Fla. To succeed Thomas W. Head, elected treasurer (whose term expires 1922), George Wilson, Lake Forest, Ill.; and to succeed Arthur Smith, elected trustee (whose term expires 1921), G. Hennenhofer, Great Falls, Mont.

As it was voted at the Cleveland convention to abolish all standing committees, there are no committees to be appointed at this time. President Jensen will appoint special committees as the occasion arises.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received for the Service Bureau Publicity Fund to January 5th:

Previously acknowledged	\$262.00
Joseph Bailer, New York City	5.00
William Brock, Chester, N. Y.	4.00
William Goodall, Manchester, Mass.	5.00
John Barnett, Sewickley, Pa.	5.00
Henry A. Brown, Port Chester, N. Y.	5.00
R. Fischer, Bernardsville, N. J.	10.00
James Donald, Natick, Mass.	5.00
Ross Gault, Chester, N. Y.	5.00
Robert Finnie, Quincey, Mass.	5.00
Robert Marshall, Glen Cove, L. I.	5.00
James Davidson, Tuxedo Park, N. Y.	5.00
Kalman Nagy, Bernardsville, N. J.	2.00
James MacAlister, Cedar Hill, N. Y.	7.00
Arthur Stratford, Somerville, N. J.	5.00
Harry Cartwright, Lenox, Mass.	4.00
William Gray, Newport, R. I.	5.00
William Mills, Ashland, N. H.	3.00
Ernest Carman, Washington, D. C.	2.00
A. Bieschke, Noroton, Conn.	5.00
Robert Williamson, Greenwich, Conn.	15.00
James Warr, Seal Harbor, Me.	5.00
D. L. Mackintosh, Stillwater, Minn.	6.00
G. H. Fellows, So. Euclid, Ohio	5.00
Andrew L. Dorward, Newport, R. I.	5.00
H. Sears, Hartford, Conn.	5.00
Gust Malmquist, Wayzata, Minn.	2.00
James Brown, Newport, R. I.	3.00
Henry Sabot, Somerville, N. J.	2.00
Duncan McIntyre, New Rochelle, N. Y.	3.00
Charles Ashmead, West Orange, N. J.	2.00
James Wiseman, Pittsburgh, Pa.	5.00
Charles F. Spellman, Winchendon, Mass.	3.00
Philip Bovington, Louisville, Ky.	5.00
Joseph Tansey, Tuxedo Park, N. Y.	15.00
Charles A. Ruthven, Mt. Kisco, N. Y.	5.00
Wm. J. Devery, Marion, Mass.	2.00
George C. McDonald, Newport, R. I.	5.00
William Mulliss, Kennett Square, Pa.	25.00
John I. Foxcroft, So. Manchester, Conn.	3.00
Ernst A. Muller, Yonkers, N. Y.	2.00
John Forbes, Oyster Bay, N. Y.	3.00
George Wood, Glen Head, L. I.	5.00
Wm. H. Griffiths, Detroit, Mich.	10.00
David Gustafson, Elberon, N. J.	5.00
R. Gardner, Newport, R. I.	2.00
Walter Troup, West Rindge, N. H.	1.00
John Conroy, Greenwich, Conn.	5.00
Frederic Carter, Newport, R. I.	5.00
Herman Rapp, Leedsdale, Pa.	3.00
Carters' Tested Seeds, Inc., Boston, Mass.	25.00

Total\$541.00

EMPLOYERS' FUND

The following amount has been received for the proposed fund to start a campaign to arouse the interest of young men in the profession of gardening.

Previously acknowledged	\$100.00
A. R. Speck (W. Griffith, gardener), Detroit ..	25.00
Total ..	\$125.00

Boston, Mass., Jan. 4, 1920.

Service Bureau Publicity Fund Committee,
National Assoc. of Gardeners,
286 5th Avenue, New York.

Gentlemen: It is with pleasure that we note from the last issue of the GARDENERS' CHRONICLE that you have so far secured the amount of \$262.00 towards the Service Bureau Publicity Fund and as this Bureau and what it stands for has our full approval and best wishes we take pleasure in enclosing you our contribution of \$25.00 which we herewith enclose.

Our present action is the result of a communication received from Mr. Robert Cameron, Supt. of Castle Hill Farm, Ipswich, Mass. In this communication he states that your organization is trying to put the Gardener and his profession on a higher plane. If at any time we can, through our connections, assist you to accomplish this result, we are at your service.

Your very truly,

CARTERS' TESTED SEEDS, INC.,
M. J. Collins.

SUSTAINING MEMBERS

Mrs. Edwin Thorne, Babylon, L. I. (Herbert, Brown, gardener); Mrs. David Dows, Brookville, L. I. (Henry Gibson, gardener); Irene du Pont, Wilmington, Del. (J. Buckingham, gardener), have become sustaining members of the association.

NEW MEMBERS

The following names have been added to our membership list: Earl Robertson, Ralph W. Walton, Cleveland, O.; Thomas M. Rowe, Gates Mill, O.; Albert H. Laine, Willoughby, O.; Frank L. Balogh, Youngstown, O.; E. Batchelor, Akron, O.; John Kullman, Cleveland Heights, O.; Robert Budd, Granville, O.; George McMahon, Des Moines, Ia.; George Davies, Nutley, N. J.; Paul Hamer, Woodhaven, L. I.; Robert Mackie, Mt. Kisco, N. Y.; Herbert Stuart, Larchmont, N. Y.; Herbert W. Tickner, Donald Campbell, Convent, N. J.; Dennis Foley, Newport, R. I.; Philip J. Lucking, Mill Neck, L. I.; Claude W. Bonner, Woodmere, L. I.; Frederick Duncan, New Hamburg, N. Y.; William H. Sansom, Huntington, L. I.; Edwin Saunders, Henry Sabot, Somerville, N. J.; Ellis B. Wilson, Hartford, Conn.; Michael Deegan, Port Washington, L. I.; James P. Murray, Newark, N. J.; James MacDonald, Mt. Kisco, N. Y.; Percy W. Kennaday, Montclair, N. J.; Bror E. Erickson, New York City; Frederic Ostner, Brooklyn, N. Y.; Gustave H. Beckman, New York City; Andrew Kneuker, Shrewsbury, Mass.; Kenneth Cedarman, Riverdale, N. Y.; Alexander Robertson, Chappaqua, N. Y.; George Donoran, Glen Cove, L. I.; William Quigley, New York City; Stephen Bernath, Bronx, N. Y.; Robert Irving, Shrewsbury, Mass.; David B. Allen, Jr., Port Washington, L. I.; W. Portmann, A. Hackmann, E. Baumgartner, C. G. Swenson, Clayton, Mo.; J. Prapuolenis, L. Baumann, J. F. Silva, St. Louis, Mo.; Theodore Hansen, West Orange, N. J.; Leamon G. Tingle, Pitts-ville, Md.; James Murdock, Greenwich, Conn.; Lars P. Hansen, Beaumont, Tex.; Karl S. Landolt, Brooklyn, N. Y.; Alexander Valentine, Hackensack, N. J.; Peter Smith, C. J. Young, Glen Cove, L. I.; Thomas Davies, Roslyn, L. I.; John Wilkinson, So. Tacoma, Wash.; Patrick McCormack, Scarsdale, N. Y.; David Hanlon, Washington, D. C.; G. Hennenhofer, Great Falls, Mont.; John R. Warr, Revell, Md.; Louis Seplavy, New York City; Theodore Chase, Greenwich, Conn.; Michael Fascella, Coconut Grove, Fla.; John Clarkson, Nantucket, Mass.; Paul Powers, Suffern, N. Y.; Bartholomew Powers, Tuxedo Park, N. Y.

AMONG THE GARDENERS

Henry Gilson secured the position of superintendent on the estate of Mrs. David Dows, Brookville, Glen Head, N. Y.

Alexander McKenzie resigned his position as superintendent on the A. W. Davis estate to engage in the nursery business with his brother, Ewen McKenzie, White Plains, N. Y.

John Forbes has succeeded Mr. McKenzie as superintendent of the A. W. Davis estate, Oyster Bay, N. Y.

Ernest Grey, for eight years gardener on the William du Pont estate, Montpelier, Va., has accepted a similar position at Fairmount Farms, Fairmount, W. Va.

Edwin Saunders until recently in charge of the fruit houses, Duke's Park, Somerville, N. J., has accepted the position as gardener in charge of the greenhouses under Thomas W. Head, superintendent, Melody Farm, Lake Forest, Ill.

OF INTEREST TO COUNTRY
ESTATE OWNERS

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

M. C. Ebel, Secretary
286 Fifth Ave. New York



A Giant Everbearing Quality Fruit which the U. S. Dept. of Agriculture states, "should be tried in gardens in all parts of the country."

La France King of Raspberries (Everbearing)

Raspberries from June to November! From your own garden to your own table! La France Everbearing Raspberry is Scheepers' latest introduction to the world of horticulture. Immense clusters! Giant berries—twice the size of the ordinary varieties! Firm, luscious fruit; deep colored, wonderfully rich-flavored! And few seeds!

Tested and Proved for Three Years—Continuous Crop— Easily Propagated

La France Everbearing is a remarkable plant. Its hardiness and habits—its prolific bearing qualities, and its ease of propagation—make it a horticultural phenomenon.

Planted early in the spring, it loses no time getting started. Begins bearing as early as the first week of July (the first season!) and "never lets up"—keeps right on with break after break, cluster-laden shoots, until all vegetation is completely frost-checked for the season. Even then its remarkable nature continues in evidence: La France has demonstrated its hardiness by surviving temperatures as low as 30° below zero.

La France Everbearing Raspberry propagates freely and very rapidly. A dozen plants will produce a good-sized berry patch in an incredibly short time.

Its rapid growth, its hardiness to withstand extreme cold, its immunity from fungus and insect diseases, its remarkable all-season production of fruit, make La France Everbearing by all odds the raspberry for home gardener, fruit grower or farmer.

**Now's the Time to Order.
Supply is Very Limited.**

Plant La France early this spring and have berries the first days of July. But order now. Six plants for \$10.50. Twelve plants for \$20. One hundred plants for \$150.

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Write for booklet on "La France Everbearing Raspberry." Includes additional expressions from noted horticulturists, etc.

LA FRANCE FIRST-CLASS AWARDS

Massachusetts Horticultural Soc.—New York Florists' Club—"Horticultural Soc. of New York"—"Morris County Horticultural Soc."—"Tarrytown Horticultural Soc."—"The American Institute, New York"—"Nassau County Horticultural Soc."—"Fairfield and Westchester Horticultural Soc."—"And Silver Medal. Also other Show and Fair awards wherever exhibited.

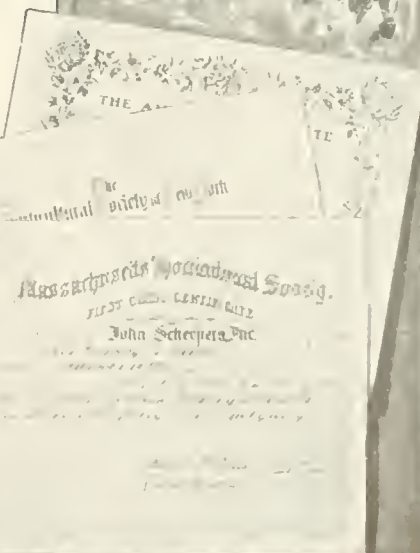
What a few La France growers say:

T. A. Havemeyer, Pres.
Hort'l Soc. of N. Y.—
"Far superior to any other raspberry. Very prolific. Large clusters. Luscious berries. A remarkable plant. Should be grown by every garden owner, fruit grower, farmer, nurseryman."

F. A. Bartlett, Tree
Specialist, Stamford,
Conn.—"The finest acquisition in years. Winter of 1917-18 killed all my varieties except La France."

Wm. Ziegler, Great
Island, Conn.—"La France 8-ft. canes loaded with large clusters. Shall discard all other varieties and grow only La France."

J. B. Cobb, Stamford,
Conn.—"Produces large crop for almost four months. Consider La France King of Raspberries."



THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Is it advisable to use manure every year in beds planted to Geraniums, and can too much be given?—A. L., Conn.

Certainly one can give too much manure to the Geranium, and especially highly nitrogenous manure from horse stables. It has been our experience that Geraniums do best and flower more freely in soil that is not manured too frequently. Every second or third year is enough to apply manure to the soil, and then it ought to be thoroughly decayed. Only a few weeks ago we saw a bed of red Geraniums standing nearly three feet high and scarcely any bloom on them. From inquiries we made we discovered that the plants had been supplied once a week with an abundance of sheep manure, which resulted in luxuriant growth, really beautiful leaves, but no flowers to speak of.—H. G.

I have a border, four feet wide, on one side of my lawn, running from the house to the sidewalk on the highway. I want to plant it to perennials, so as to have some blooms from early spring to late fall. I want blue and white flowers chiefly, but would not mind a few other colors.—S. M., N. J.

Your correspondent does not state whether or not the border is in close proximity to trees, and is heavily shaded, or has an open, sunny position. Assuming, however, that there is little shade, we would suggest that the first thing to do in an endeavor to have a border that will bloom from frost to frost, is thoroughly prepare the soil by incorporating plenty of well decayed barnyard manure into it, and breaking up the soil to a depth of at least two feet.

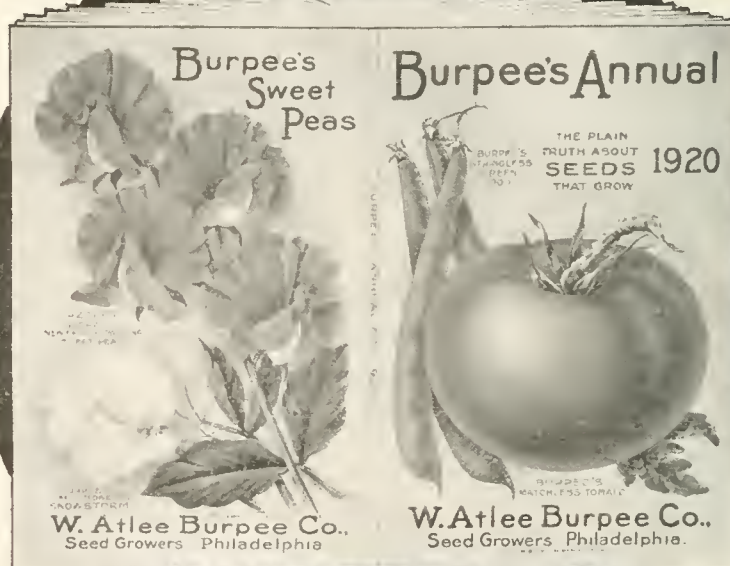
Taking a selection which would, we think, cover a long season of bloom, we will take the tallest varieties first for the back of the border.

Delphinium, Var. *Belladonna*, 4 to 5 feet high, will flower during June and July, alternating clumps of these with clumps of *Salvia Azure Grandiflora*, blue, height 3 to 4 feet, flowering August and September. A few clumps of *Aconitum Fischeri* may be added to carry the blue into October. In front of these may be planted, without taking up much extra space, *L. Candidum* and *L. Auratum*, white; these, together with *Phlox Miss Lingard*, *Phlox paniculata*, Var. *Perfection*, and *F. G. Von Lassburg* will give a display of white from June until September. The flowering taking place in the following order: *Phlox Miss Lingard*, June and July; *Lilium Candidum*, July; *L. Auratum*, July and August; *Phlox Perfection*, June and July; *F. G. Von Lassburg*, July, August and September. By cutting off the fading flowers of the phloxes they can be induced to flower a second time, thus prolonging their season.

Anemone Japonica alba, and *Whirlwind* together with *Chrysanthemum Queen of Whites* will carry the white well through October to frost.

Edging the border you may have *Ajuga Reptans*, which grows three inches high, and produces purplish blue flowers in April. Then behind this, and in front of the taller plants enumerated, one may have along the front of the border, groups of *Iris cristata*,

Burpee's Seeds Grow



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Seed Growers Philadelphia

6 inches high, with blue flowers in May. *Iris Florentina*, 2 feet high, has white flowers in May. *Arabis Alpina*, white, May flowering; *Achillea*, "The Pearl," white, June and July; *Iberis Semperirens*, May; *Aster Alpinus*, Var. Fairchild, white, and blooming in August, and *Linum perenne*, in blue and white flowering in May, will make for a season of continuous bloom.—H. G.

Here and There

From Day to Day Out in the Fields with God

The little cares that fretted me,
I lost them yesterday,
Among the fields, above the sea,
Among the winds at play;
Among the lowing of the herds,
The rustling of the trees,
Among the singing of the birds,
The humming of the bees.

The foolish fears of what may hap,
I cast them all away
Among the clover-scented grass,
Among the new-mown hay;
Among the rustling of the corn,
Where drowsy poppies nod,
Where ill thoughts die and good are born
Out in the fields with God.
—Elizabeth Barrett Browning.

AMERICAN HOMES AND GARDENS.

We in America have chosen with lavish hand such types of architecture and landscape gardening design from every land as best suit our individual tastes and conditions, and are surely developing a type of landscape gardening which may be termed distinctly American; it is subtly, yet as clearly marked as our other gradually crystallizing national characteristics. Its dominant note is in common with all our other activities, characterized by a freedom in our choice of the best that the world has to offer; it is an appreciation of the necessity of the furnishing of the grounds and gardens immediately about the house, with taste commensurate with the indoor furnishings of our homes, for our outdoor life must needs be as pleasant as the hours spent within doors.

Setting our "out-of-doors living-room"—our gardens, a bit apart for our own enjoyment and that of our friends, we choose to separate them from the outside world by a park-like treatment of borders and boundary plantings of trees and shrubs, rather than the high walls of brick or stone behind which our friends in other lands maintain their privacy. These living walls of trees and shrubs on border and boundary serve better to screen objectionable views, and presenting vistas across shaded lawn or meadow—form the most pleasant and agreeable setting for the house and gardens. This type of American landscape gardening is well defined in its essentials, the details of appropriate trees and shrubs and plants for the setting of the house and gardens, the proper types of trees for lawn and screen, or other situation vary slightly in each case. Results in the planting of our grounds must be quickly obtained, for we are not satisfied to wait for tedious years while tiny plants and trees grow to such size as will make a fitting setting for the home of grand-children—we prefer to live in the atmosphere of beautiful surroundings ourselves.—*Andorra Nurseries' Booklet*.



It's High Time You Wrote for That Ten-Ten Catalog

When I said that very same thing to a gardener yesterday, he replied: "What do I want of another seed catalog? Already have a pile as high as your head. Heaven knows, I'll never have time to wade through **them**, let alone even looking through yours.

"Besides, what's all that Ten-Ten bunk, anyway? Who ever heard of a catalog being called Ten-Ten? Sounds like the name of a gambling game."

"You have struck the nail plumb bob on the head," says I. "Of course you haven't time to go through all those catalogs. That's why we made one that you could. Made it the Ten-Ten way. The way a lot of your gardeners said you wanted it made.

Describing the Ten-Ten in a nutshell—everything is grouped in tens. The ten best of everything that's best, whether it be seeds, hardy plants, roses or evergreens.

Send for it, and if you don't go through it carefully, from cover to cover, and thank us for making the kind of catalog you gardeners would make, instead of the kind printers want to make—then you just let me know, and I'll send you one of the Ten-Ten group of roses with my compliments.

R. Roehrs

Julius Roehrs Co
At The Sign of The Tree
Box 20 Rutherford N.J.

ECONOMIC BOTANY.

It is difficult to understand why the study of botany is so repellant to the average person. It is rarely one meets with a student who takes up this study out of love for it, and when the college or high school course is done, what they do learn is promptly forgotten. Even among our own profession where you would think a good knowledge of botany was almost essential, very few are interested in it. In fact, the practical grower seems to think that a knowledge of it would be detrimental to him. It is quite true that he can get along without it, as it does not seem to be an essential part of the growing of plants.

This, however, is an extremely superficial view of horticulture. When we stop to realize that directly or indirectly a very large proportion of the wealth of the world is derived from the vegetable kingdom, such as food, clothing, building material, medicines, rubber, oil, dyes, resin, etc., it is a wonder that more students do not follow the study.

It may be there is not much direct profit in studying systematic botany or the classification and nomenclature of plants, or in geographical botany which relates to their distribution, but with the economic botany which confines itself to the study of the values and uses of plants to mankind, there

DO YOU WANT THE NEW PLANTS?

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Write for our 1920 catalogue, offering many of the Arnold Arboretum Plants and other recent introductions.

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is a field that would be attractive to the most materialistic mind.

The potential wealth hidden away awaiting the experimenter and investigator is tremendous. Some of our insignificant common weeds may have great wealth stored away in them, which only awaits the discoverer.

At one time the potato and tomato were semi-poisonous weeds. The call has already gone out for some plant from which to make paper. Forests are fast being used up and some plant other than trees will have to be found for this purpose. There are thousands of acres of swamp land that are available for the purpose if the right kind of plant can be found that will make suitable pulp or fibre.

There are thousands of unknown drugs and chemicals still hidden away awaiting the investigator; edible fruits to be investigated, grown and exploited. Praise-worthy efforts are being made in many of our schools, colleges and experiment stations to arouse the interest of the young men of the country and to teach them the importance of the science of botany in its economic aspect.—*National Nurseryman*.

THE WEED PROBLEM.

The surprise is that more discussion and more attention is not given to the weed problem. Weeds decrease our crop yields to such an enormous extent, they interfere so seriously with our farming operations, and they cause such tremendous losses in dollars, that concerted effort should be directed to their reduction and eradication. Any community, large or small, that sets itself the task of practically eliminating its weeds and adopts and sticks to a program of action can work wonders. It is quite certain that everyone knows what a "weed" is. Probably no one of us has had the term defined but our conception of its meaning is very clear. It may be that at one time in our early days we were told to pull the weeds in the corn field or garden; to mow the weeds along the fence; and at such a time it is certain that no words of explanation were needed to indicate which the weeds were. We have come to consider as "weeds" those plants which tend to grow where they are not desired; plants which tend to resist man's efforts to subdue them; plants which resist frost, heat, dryness;

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An abridged edition will be forwarded to garden lovers who do not have a copy of the regular Sixth Edition, issued in 1919.

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which will grow in most any kind of soil and under all conditions; plants which produce seeds in enormous numbers and have other rapid methods of propagation; plants in themselves sometimes truly beautiful, but that have for us lost their charm; plants useless and troublesome. Emerson said of a weed: "A plant whose virtues have not yet been discovered."

A large purslane plant will produce 1-250,000 seeds; a single Russian thistle plant will ripen 100,000 to 200,000 seeds; tumbling mustard, 1,500,000; shepherd's purse, 50,000.

The seeds of many weeds are very small and escape notice. A pound of clover dodder has 1,841,360 seeds; common plantain, 1,814,360 seeds; lamb's quarters, 604,786 seeds; Russian thistle, 266,817 seeds; wild mustard, 215,995 seeds; wild oats, 25,493 seeds. If 60 pounds of wheat are planted to the acre, and this wheat has 2 per cent of wild mustard seed there will be distributed over that acre 388,791 mustard seed.

Not only do weeds produce seeds in tremendous numbers, but seeds with an ability to live a long time. The seeds of some weeds, when buried in the soil, may retain their power to germinate for 15 to 30 years. Such is true of the seeds of tall pigweed, black mustard, shepherd's purse, dock, yellow foxtail, chickweed and others. —*Colorado Experiment Station Bulletin.*

THE POWER OF GROWTH.

There is no human engineering which can compare in power with the silent machinery of a growing forest. It has been estimated that the physical energy of the sap in the plant is fourteen times that of the blood in man. Professor Clark, of the Massachusetts Agricultural College, has succeeded in measuring the power of the growth of a squash. He harnessed it in iron, put it in prison, and gave it a weight to lift. The squash, thus harnessed, was placed in a box in such a way that it could grow only by pushing upward, and lifting the long lever with the weights suspended on it. The result was that the squash steadily pushed its way upward, carrying the bar and weight with it. On August 21, it was lifting 60 pounds; September 15, it was lifting 1,400 pounds; October 18, it was lifting 3,120 pounds; and on October 31, it reached the 5,000 pound figure. How much more it could have carried is not known, for at this point the harness cut into the rind of the squash.—*Country Life.*

THE TREES.

The trees have music of their own, a soft and soothing monotone, that lulls a man to rest. I have a volume to peruse, but, under them, I snore and snooze, my chin upon my breast. To sit beneath a swaying birch is much like being in a church; your drowsy eyelids close and to the realms of dreams you hie, until an active, loathsome fly camps down upon your nose. How often I have lain awake until I saw the morning break, and slumber would not come; and I would sadly leave the hay, to face another toil-some day, all punk and on the hum. My nights are often things of dread, I toss around upon my bed, and find no comfort there; but when I sit beneath a tree, the sweet restorer comes to me, its coattails in the air. The trees have voices sad and sweet, their world-old music they repeat, a solemn, sylvan choir; the same old song they used to sing when Earth was but a half-baked thing, and mortals worshipped fire. They croon their mournful lullaby while men are born, grow up and die, they sigh with every breeze; and when I quit this vale of tears I hope to sleep a million years beneath the nodding trees.—WALT MASON in *The Canadian Countryman.*

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**ONE HORSE
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Actual tests on the Minneapolis City Golf Course at Glenwood Park, under supervision of Supt. Theodore Wirth, showed a saving of 40% in operating costs in favor of the Beeman Triplex mowing outfit as against 2 horses with triple mowing outfit.

Consider also the many other advantages of using the Beeman instead of horses,—it works faster, mows 25% to 100% more ground in the same length of time;—it does not have to be fed or cared for when not working;—it can be worked as long as necessary in an emergency;—it mows close to fences, bushes, trees and goes under low brushes;—it does not damage the turf as horses hoofs do;—it can be used for hauling, plowing and as a self-propelling 4 HP. power plant for belt work when not in use for mowing. It's a mighty handy machine to have around on golf courses, parks, cemeteries, country clubs, etc.

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REVIVING WILTED BLOSSOMS.

Many lovers of wild flowers have doubtless been annoyed by the apparent impossibility of getting certain beautiful species home in good condition. Among the flowers of the eastern States which wilt almost while one is plucking them, the dainty little Spring Beauty and the gorgeous but bashful Cardinal flower come to mind.

If one but knows how, one may freely gather these and others like them, and take them home in the thoroughly disreputable condition which they at once effect, with calm certainty of being able to restore them to their natural beauty. It is merely necessary to conquer the inevitable instinct to place them in cold water, and instead use the fluid piping hot, with more or less alcohol added, according to condition of the flowers and experience with the various species.

This method of restoration applies equally well to cultivated blossoms as to wild flowers.—*Scientific American*.

THE MOCCASIN FLOWER.

Most people who have roamed through the rocky hills of the Northern States during May or early June are familiar with the Pink Lady's Slipper or Moccasin Flower. These strange-looking plants are orchids, and this particular kind inhabits moss-covered sand overlying rocks at considerable elevation above the surrounding country; also it may be said that they keep away from civilization as far as possible. Hogs destroy them and mice will eat the roots, which together with picking by people, probably accounts for their aloofness. Ordinary soil would not do at all, and they seem in their way as exacting as the hothouse orchids. The Pink Lady's Slipper (*Cypripedium acaule*) is the State flower of Minnesota, adopted back in 1893, and the first State flower of the first State to take such action. The flowers are borne singly on stalks 8 to 12 inches high. The plant prefers partial shade, that of the pine usually. The flowers are pink and are striking in appearance, resembling a huge spider. The leaves are very distinct also and even without the flower are attractive and interesting.—W. E. D., in *Rural New Yorker*.

OF GENERAL INTEREST

On January 29, 1920, in the Museum Building of the New York Botanical Garden an Iris Society will be organized. The organizers are Lee R. Bonnewitz, James Boyd, W. F. Christman, H. A. Gleason, Mrs. Francis King, B. Y. Morrison, Miss Grace Sturtevant and John C. Wister.

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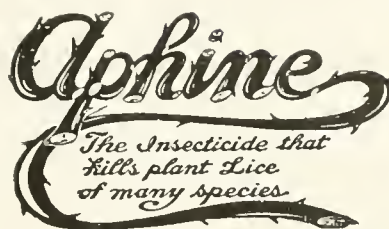
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Or to say it another way.

Upon the things we possess is our position or standing frequently judged.

There are some of us who won't ride in a Ford Taxi when we are in New York.

There are others of us who buy our clothes at a certain tailor's—because—well, because we sort of want our friends to see the label on the inside of the collar.



And all these things add to the pleasures of living. It's meant that it should be so.

In like manner, you who work in U-Bar greenhouses, knowing that they are the top-notch of greenhouses, take pride in letting folks know about it.

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Once For All

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OTHER day, we received a letter from a man in Chicago.

It said, among other things, "Your seeds did remarkably well, much to my surprise, for I was told I could do nothing with English seeds in this climate."

Now, we've heard that statement before.

And we've had similar letters from every civilized country in the world.

And from many that aren't civilized. From Northern Canada and Southern South America; from the veldt of the Transvaal, and the plateaus of Thibet, and the steppes of Russia. Letters telling of successful gardens grown from Sutton's Seeds.

We Wrote to Every Experiment Station in the United States

So we knew, when we began selling Sutton's Seeds in the United States, that they would grow. We knew, because of what Sutton's Seeds had done in other parts of the world; and we knew from the results that many private gardeners, who took the Sutton Seed habit across the seas with them, were getting in some of America's finest estates.

But we wanted to get all the evidence we could in the case. We wanted to settle, once for all, the general principle, whether it is important to have seed locally grown or not. So we wrote to the Directors of all the Experiment Stations in the United States.

The replies we received, were almost unanimous in agreeing that it is more important to grow seeds of vegetables and flowers *where they reach the highest degree of perfection*, than to grow them near where they are to be planted.

And the great importance of having carefully selected, thoroughly fixed strains was emphasized with equal unanimity. **Sowing seeds there's any question about, makes painful and profitless gardening.**

American Seeds Not "Locally Grown"

Another thing that was pointed out was that practically no vegetable or flower seeds sold in America are grown in the locality where they are sold.

They are grown where soil and climate conditions favor the production of the different seed crops—largely in California—3,000 miles from the Eastern sea-board, the garden spot of the United States. The fact that they are **sold** locally cannot, of course, affect their growth!

Many European grown seeds—such as celery and carrots from France, and cabbage and cauliflower from Scandinavia—have been bought, by American seedsmen, as the best that could be had. Much of the flower seed before the war was imported from Germany.

Seed growing has been so largely sectionalized, **because conditions permitting a slow, natural, long season of growth and unhurried maturity produce the best seeds.** Such are the conditions where our seed crops grow.

And you can rest assured they will grow for you, as well as they have for the following, who have, unsolicited, sent us these reports:

"The results I have obtained from your seeds, both Vegetable and Flower, warrant my saying that they cannot be excelled, and certainly are not equalled by any that can be procured locally." Dr. Robert E. Rose, Ph. D., **Seattle, Washington.**

"On my very hard soil, your seeds give better results than any I have ever tried," Mrs. J. B. Mason, **Durham, North Carolina.**

"I have had better results from your seeds than from any others I have ever tried," Miss Constance Emery, **Portland, Maine.**

"I have taken first prize for Tomatoes for four consecutive years at our State fair, from your seeds. Last Fall I had 83 competitors," Mr. R. M. Greig, **Anaconda, Montana.**

"Your seeds were exceptionally fine the best we have ever had," Mrs. F. N. Doubleday, **Oyster Bay, Long Island.**

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Michael Gorman, caretaker for the estate of Adie, 1111 Chestnut Hill, Brookline, Mass., and one owner of the estate.



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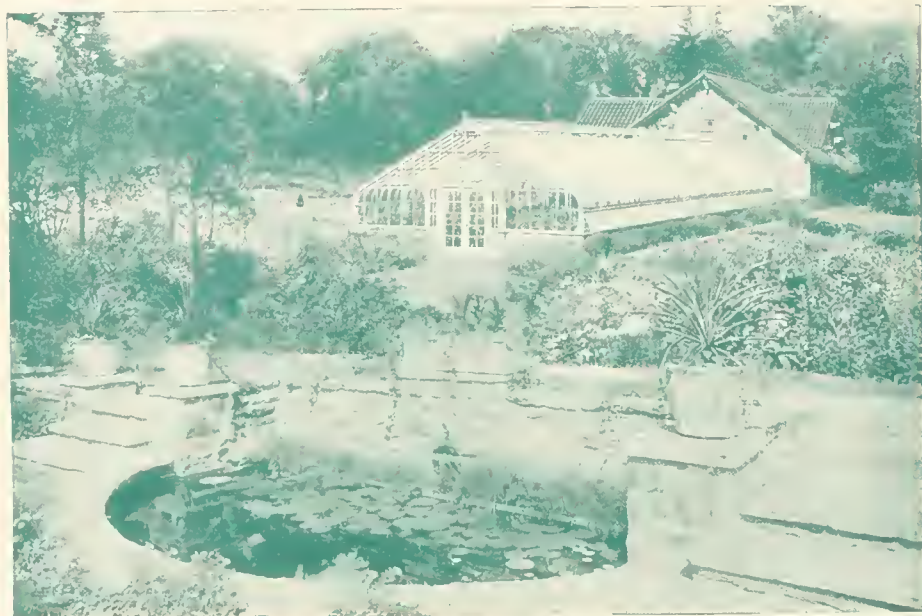


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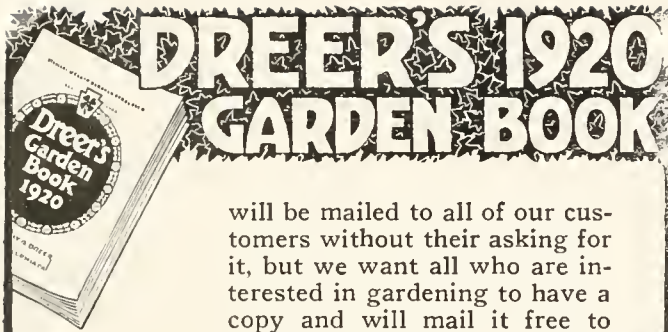
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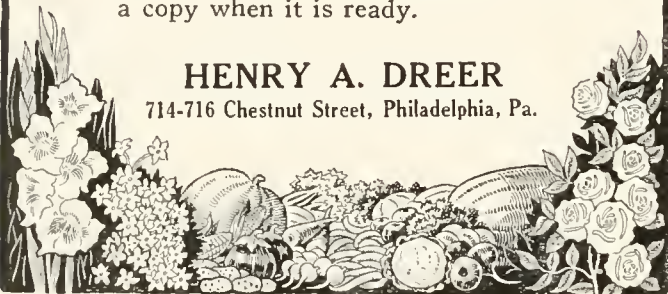
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

FEBRUARY, 1920

No. 2

Things and Thoughts of the Garden

THE ONLOOKER

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A REAL live topic of interest in our horticultural world at this time is that of plant propagation, which has been brought to the attention of many nurserymen and florists in a rather abrupt manner by the enactment of the much abused Plant Quarantine Act. Perhaps the inconveniences resulting from this drastic measure may not have such a lasting effect as was generally expected. Time alone will tell. In the meantime we may be sure that enterprising men are giving more time and attention to this subject than has hitherto been found necessary or profitable, and furthermore a good propagator ought to be assured of a steady job for some time to come. It is fascinating work, especially when there is opportunity to practice it with a large variety of plants. Knowledge of the various methods by which plants are propagated is open to all who seek it, but it is not given to all to be equally successful in putting that knowledge into practice. Some men seem to be born with the happy knack of being always able to do the right thing at the right time. Some call it intuition, some call it luck, but call it what you will it is a wonderfully good asset. In combination with a keen love for plants, a thorough understanding of their likes and dislikes, together with a good stock of patience, we have the chief essentials which go to make a first-class plant propagator.

* * *

Within the next few week millions of seeds will be sown both under glass and out-doors, and the results awaited with eager interest. It is safe to say that a goodly proportion of these seeds will from various causes fail to realize the expectant hope which was kindled when they were sown. It seems a simple matter to open a packet of seeds, scatter them in the soil and look for a big germinating percentage. Sometimes it is as easy as that, yet those who have handled seeds in great variety know there is difference enough to keep one up to the mark in the strict observance of certain details if anything better than negative results are to be obtained. Seeds of good vitality are of course the first essential, and practical experience has shown that the largest and heaviest seeds produce the best plants, so that plant selection might well begin at the beginning—with the seeds.

Seeds more than one year old are not necessarily dead, at least in the case of most, if not all of our common garden plants. Several kinds of vegetable and flower seeds I have sown after keeping five years have given

practically as good results as at first. To be on the safe side it is just as well to make a germinating test of doubtful seeds, at the same time bearing in mind that old seed is slower and more irregular in germinating. This may be partly overcome by soaking the seeds in hot water for a few hours. Seedlings get a better start if the soil is of a light, friable nature. In the greenhouse, where conditions are under control, better results are sometimes secured by germinating the seeds in sand, cocoanut fibre or sphagnum moss. In the open many seedlings perish in hard ground that could be saved if the drills were filled in with old compost. Thousands of fine seeds every year are suffocated because buried too deeply; others rot because sown too soon in wet, cold soil, while others fail to appear because of shallow covering during hot, dry weather.

Damping-off fungus claims many victims because of careless watering and ventilation, or by reason of overcrowding and the postponement of transplanting till a more convenient time. Sow thinly and thin or transplant early is a pretty good maxim to follow. In the case of seeds which may take months to germinate the soil in the seed pans may become coated with algæ with disastrous effects. Sterilization of the soil and the use of boiled water will be found helpful in overcoming this.

Many people regard mid-summer as the proper time to sow seeds of hardy perennials, but where there is greenhouse space at command, there are certain advantages to be gained in doing it right now. The amount of space required for ordinary purposes is very little, dozens of seedlings can be raised in a four-inch pot, while for transplanting a flat three inches deep and about twelve inches square will accommodate three dozen plants nicely. After this their sojourn in the greenhouse need not be long if cold frames are handy, and by the middle of May we have sturdy plants ready to set out in nursery rows, becoming well established before the likelihood of summer heat and drought and well able to go through their first winter safely with just ordinary protection. A few kinds will flower late the first season when sown thus early, and in the case of hybrid strains this is an advantage if color effects are seriously considered, as it affords a chance for selection before setting the plants in their permanent quarters.

Few winter-flowering greenhouse plants of recent introduction have been received with such general favor

as *Buddleia asiatica*, and it is by all means deserving of all the good things which have been said in its favor. Of free habit of growth it is a first-class plant for conservatory decoration, coming into flower right after the *Chrysanthemums* are over, and under cool conditions remaining in good form from two to three months. The long, arching racemes of white flowers give it a very graceful appearance, and they have a sweet odor which makes them still more pleasing. Everybody with a greenhouse should grow it. Cuttings rooted in April make good flowering plants in six or seven-inch pots, and the plants do well if the pots are plunged out-of-doors for the summer.

Erlangea tomentosa is another comparatively new plant which can be regarded with equal favor. Though a native of tropical Africa, it thrives under the same cool conditions as the *Buddleia*, for which it makes an admirable companion and serves the same useful purpose. It is a free branching plant with grayish leaves that are strongly scented, the mauve-colored flowers being borne in clusters and last well when cut.

Most people are fond of blue, and flowers of this color are not too plentiful in the winter time. The introduction of *Coleus thyrsoideus* from Central Africa a few years ago gave us a notable addition, and when well grown this is a worth while plant with its long, upright racemes of bright blue flowers lasting in good condition for three months. A few plants arranged in combination with *Begonia* "Lorraine" makes a very stunning effect. It is rather more difficult to grow real well than are the common kinds of *Coleus*, but it well repays the extra care. Early in May is a good time to sow seeds, which as far as I know, are listed in only one catalog, that of R. & J. Farquhar & Co., Boston, Mass.

Browallia speciosa major as a greenhouse plant may be new to some who know it very well as an annual in the summer flower garden. For continuous blooming few plants can equal it. Seeds sown in early June will give plants flowering by the end of September and they keep it up without a break for eight or nine months. It grows and flowers just as well in a sunny window as in the greenhouse. Two or three pinchings in the early stages of growth will improve its natural loose habit and a better appearance is made if three plants are grown together in a deep pan. The flowers are violet-blue with a small ring of white in the centre and borne singly in the axils of the leaves.

A flowering plant which appears gay or despondent, according to the time of day or weather conditions, is the so-called Bermuda Buttercup, *Ovalis cernua*, a native of sunny South Africa. On a sunny day it makes a gay display with its wide open flowers of bright yellow hue, but at night and during dull weather the flowers close and so remain until touched again by the life giving rays of the sun. In spite of this characteristic, which might cause it to be regarded by some with disfavor, it is well worth growing for winter display in a cool greenhouse. Few plants are so floriferous, and started in August they are in good form all winter. As a basket plant it appears to good advantage, and when grown in pots it is good practice to start them in, say, four or five-inch pots and later shift into a size larger; this will correct the tendency of the crowns to rise above the pot and also encourage them to grow and flower with renewed vigor.

The very pretty and graceful Fairy Primrose, *Primula malacoides*, has produced several forms which are superior to itself in many respects, one of the best being

the variety called "King Albert," sent out, I believe, by the Carter Seed Co., of Boston. It is a marked improvement on the type in every respect and received an R. H. S. award of merit when shown in London three or four years ago. The individual flowers are larger, of more rounded form, and in color a lovely shade of rose, while in habit it is more compact and if anything more floriferous. It is not at all unusual to find plants in five-inch pots with twenty or more flower stems developed at one time, and best of all these do not flop. Altogether it is a very fine addition to the list of choice decorative plants available for winter use in the cool greenhouse.

* * *

During an extreme of cold weather, such as has been experienced in many sections of late, it sometimes happens that from one cause or another plants may be frozen, particularly plants that are in transit and sometimes even in greenhouses that are not adequately piped. Whether in such cases the plants are injured beyond recovery may depend entirely on the way in which they are handled immediately after the mishap. The important thing to keep in mind is the fact that the liquid contents of the plant cells have expanded, and if subjected to a sudden reaction the cell walls are ruptured beyond repair and the plant collapses, or at any rate the affected part. The thing to do therefore to assist such plants to recover is to allow them to thaw out very gradually, and this is brought about by sprinkling them over with cold water, shading from sunshine and keeping them in a cool temperature till the process is complete. Prompt application of these methods might often save plants that have been touched by frost and restore them apparently none the worse for the experience. In the case of a greenhouse where the temperature may get pretty near the danger mark, at times it is safer to keep the plants somewhat drier than usual while the cold spell lasts, as when their cells are quite turgid with liquid they are most susceptible to injury from frost.

* * *

Of late years wonderful progress has been made in improving the garden race of *Antirrhinum*, and the common Snapdragon has become one of the fashionable flowers of the day. As grown under glass at the present time it must surely surpass anything that could have been dreamed of not so many years ago, especially when we consider it was one of the seventeenth century garden plants. Its prominence now as a cut flower for use in the winter and spring months is not to be wondered at when we see the large handsome spikes bearing flowers of such pleasing colors. Good progress has been made, too, in the development of good strains for outdoor bedding, for which purpose the intermediate section is ideal, the plants being of a sturdy, even growth, well branched and bearing good flower spikes in a wide range of beautiful colors. For a mass display they are great and if given good culture they respond with wonderful results. It is a good plan to set out the plants as soon as conditions are right, and unless early flowers are desired it is just as well to pinch out the first flower stems. This will give bushier plants, and for a purely garden effect result in a better display, while if the seed pods are promptly picked off, flowering will continue until stopped by killing frost.

GOVERNMENT

Government is not an edifice that the founders turned over to posterity all completed. It is an institution, like a university, which fails unless the process of education continues.—CALVIN COOLIDGE.

The Sweet Pea—Its Culture—Some Representative Varieties

G. W. Kerr

No other annual flower is so widely cultivated, perhaps, as the sweet pea, which is largely due to the fact that the merest novice in gardening is successful with it. Then, too, there is the question of cost—for a few cents' worth of seeds we can have a row or clump of the most exquisitely colored and delicately fragrant flowers. The sweet pea will thrive in virtually any good garden soil, though, of course, extra cultivation will repay the grower. And if the blooms are cut systematically and the pods are not allowed to set, the vines will continue to flower for about three months, sometimes longer.

The following points should be observed in the cultivation of sweet peas: First, the soil should be drained, unless the ground be of such a nature that in a season of excessive rains the water will not lie, and so cause the roots of the plants to rot, or start mildew. Second, the seeds should be sown in such a position that no excessive shade will interfere with the sturdy growth of the vines, as too much shade encourages a spindly and weak vine, with few, if any, flowers.

You should choose, therefore, a spot in the open, where the plants may have all the available light, and air, though a little shade from the scorching mid-day suns of June and July will be found beneficial.

Soils that are prepared for a vegetable garden will give excellent results, but for this queen of all annual plants, a little extra care will be well repaid by the additional size of flower, longer stems, better color and a prolonged period of blooming.

Whatever may be the composition of the soil, a start should be made in the Fall of the year by trenching it to a depth of two or three feet. If the sub-soil is poor, it would be absurd to bring it to the surface, but it should be broken up, turned over, and mixed with any old garden refuse or stable litter. This is especially valuable in the case of very heavy land, since the rough material will tend to drain the soil and sweeten the trench.

Thoroughly mix with the upper soil a liberal quantity of half-decayed stable or cow manure—the latter is preferable if the soil is light—adding a good dressing of bone meal as the work proceeds. The top of the trench should be filled in as rough as possible, at the same time mixing with the soil thoroughly rotted manure, and leaving all Winter, so that the frost, snow and rain may have a better chance to exert their mellowing influences.

As soon as the frost is out of the ground in the early Spring and the soil is in a nice dry condition, the rows should have a fairly heavy coating of acid phosphate, which can be raked into the soil and all made ready for planting. Soils deficient in lime will be greatly benefited by a good dusting of fresh lime put on as soon as it is slaked.

To those who want the very best results we advise sowing the seeds in pots. This should be done in January or February, according to location using pots of three to four inches in diameter. A suitable compost for this consists of turfy loam, leaf soil, and a little sand, all thoroughly mixed. Four seeds will be sufficient for each pot. The pots are then placed in a frame or cool greenhouse as near the light as possible, so that the growth will be kept sturdy and dwarf. When the vines are two or three inches tall, insert a few twigs in the soil to keep them in an upright position.

Avoid watering the plants too heavily on account of frosts, for the same reason, and the careful grower will see that the frame is covered and protected on cold nights.

Air should be given on all favorable occasions. As Spring advances the sashes should be entirely removed during the middle of the day, subsequently keeping them off all day and night as the season for "planting outside" approaches. According to locality and weather conditions, the young plants should be set out from early March to early May.

One pot is sufficient for a good clump. When planting in rows each potful should be set out about eighteen inches apart. Place the entire ball of soil with plants and twigs, taking care to keep all intact, in the ground.

Those who have not the conveniences for the pot method of culture should sow the seeds as early in the Spring as soil and weather conditions will permit. A small trench or furrow about four inches deep should be made, and the seed sown evenly, using one ounce of seed to a fifteen-foot row, covering the seed with two inches of soil.

When the seedlings are about two inches high, thin out the young plants, leaving one to every six inches, as this will be found to give more room for air and light to circulate among the growing vines. As the vines grow the soil should be hoed up to them on either side, thus strengthening the plants and keeping them in an upright position.

To prolong the blossom season it is advisable to sow a few of the new Early Flowering Spencers. Started at the same time, they begin to bloom two to three weeks ahead of the regular Spencer Type, while if the flowers are regularly picked they will bloom over quite as long a season.

Might I suggest the following varieties as being representative of both types and which under normal weather conditions will give satisfaction to the exacting grower:

Early Snowstorm, pure white.
Early Pink Beauty, deep pink.
Early Daybreak, cream, ground pink.
Early Zephyr, pale blue or lavender.
Early Bluebird, mid blue.
Early Exquisite, cream, edged rose.
Early Daintiness, white, edged rose.
Early Splendor, deep rose, self.
Early King, crimson scarlet.
Early Lavender King, lavender, self.
Early Mauve Beauty, mauve, self.
Early Glorious, rich purple.

King White, fine pure white.
Constance Hinton, black, seeded white.
Floradale Fairy, cream, self.
Elegance, pale blush.
Elfrida Pearson, light pink.
Margaret Atlee, rose-pink on cream.
Beryl, salmon pink.
Hercules, deep pink.
Barbara, salmon.
The President, orange-scarlet.
Fiery Cross, bright fire-red.
George Herbert, rosy carmine.
King Edward, large crimson.
Orchid, lavender.
Royal Purple, warm purple.
Cherub, cream, edged rose.
Mrs. Cuthbertson, rose-pink and white.
Warrior, maroon.

ON THE WRONG SCENT

Half the world is on the wrong scent in the pursuit of happiness. They think it consists in having and getting, and in being served by them. It consists in giving and in serving others.—DRUMMOND.

RAISING PLANTS FROM SEED

Sowing seeds is an art, but many people seem not to realize it. Though wishing to be successful they begin operations by buying any kind of seed, instead of being careful to get the best. Seed must be fresh, and some sorts require to be sown almost as soon as they ripen if the best results are to be obtained. Good seeds are large for their kind, bright-looking, and well filled with food material, enabling young seedlings to make a good start.

Moisture, air, suitable temperature—if any of these be absent, even the best seed will not germinate properly. Once the seeds have been started on the road to germination, the soil must be kept *continually* moist, but the surface of the seed bed must not be flooded. The best plan is to watch carefully as soon as the surface shows signs of drying, water gently with a very fine rose. This may be necessary three or four times a day.

With regard to air, the germinating seeds cannot have too much; so see that there is ventilation and that the soil you provide is friable, porous and well aerated, besides being sweet and clean, before putting your seeds into it. All seeds will not germinate at the same temperature, e. g., those that are natives of the tropics require a higher temperature than those of temperate regions.

Strong plants are secured by quick strong germination. Remember that—

1. All seeds germinate more quickly in darkness.
2. Seeds must be sown the right distance below the surface. Deep sowing is one of the chief causes of failure with annuals.
3. Each seed is a unit, and to give it a full chance the soil must be pressed firmly round it on every side.
4. No obstruction must be present which will hinder the seed from coming up once it has started to grow.

REPOTTING ROOT-BOUND PLANTS

THERE are certain plants, such as Palms, Camellias, Azaleas, and many kinds of hard-wooded things, that do not need repotting annually. With good cultural care they can be maintained in good condition for two or three years in the same pots. There comes a time, however, when the need for fresh soil is imperative. New energy must be put into the foliage or the wood will become too hard and the circulation of the sap will not be sufficiently free. Repotting plants which have stood so long involves a certain amount of risk, which can only be obviated by certain precautions known and practised by the experienced plant-grower, but with which amateurs generally are not conversant. The danger is that the roots may not travel freely from the old ball and take full possession of the new compost. The tendency which roots have to keep moving in the same direction has to be reckoned with and guarded against.

Professional growers make a point of repotting just when the roots are taking full possession of the compost, but before they have completely filled it with fibres, they being well aware that if a plant comes into a root-bound condition there must be a check to free growth, and that there is a difficulty and loss of time in inducing that plant to go away again into robust growth. If a Palm, for instance, which has been several years in the same pot is examined it will be found that many of the roots have circled round the pot and have formed a solid mass; have, so to say, eaten up the soil and so occupied the drainage that removing the crocks without injury to the roots would be impossible. In potting plants in this condition the compost should be neither wet nor dry, and every particle of it must be rammed in, so that it is as solid as the old ball.—*Gardening Illustrated, English.*



How to Reduce the Cost of Living

(The following article bearing on a subject in which the whole country is most deeply absorbed at this time, and which appeared in a current issue of *South African Gardening and Country Life*, contains so much that is applicable to our own readers that we republish it in these columns. While the high cost of living or the cost of "high living" (as some thinkers are wont to refer to it), will not be entirely solved by the recommendations of our contemporary, home production of food products will, however, certainly tend to relieve some of the shortages, whether actual or manipulated and consequent sharp advances in their cost. The home garden brings some relief, as our contemporary writes, "it is the grain of wheat that makes the bushel."—EDITOR.

FOR four years roughly half the world's population has been engaged in making war material or fighting with what was made.

In pre-war days these millions would have been engaged in producing the goods we buy from stores. All the time these millions were fighting or making munitions they had to be fed, clothed, and housed.

The other half of the world's population could not make sufficient goods to provide themselves, plus the—from an economic point of view—unproductive half, with their requirements.

The demand became greater than the supply. The law of supply and demand regulates prices, and so prices went up.

The workers found they had to pay more for necessities of life, and so demanded and got higher wages.

Before prices are ever likely to fall the supply of necessities must exceed the demand, and this has got to be the case before there is any hope of reducing wages and thus production costs.

There is therefore as great a need to-day to prevent waste and increase production as ever during the war period.

Every garden can help to reduce the cost of living if it is made to produce as much as possible, and so save the buying of packed goods from the store.

If vegetables and fruits are eaten as far as possible instead of packed goods, the demand for the latter becomes less, and gradually the price will fall. The increased amount you spend with your storekeeper for such goods may appear hardly worth saving, but you would no doubt like to save a few pounds on a suit or costume. But if you can help to reduce the cost of packed goods you help to reduce the cost of all goods, because the man who makes—say, suits—pays less for packed goods, and so does not have to demand so much for his goods or services in return.

Even slight reductions react all round. There are also those whose incomes are fixed and who cannot increase them. Under the strain of present day prices these people can hardly live. It is therefore something more than patriotic for all of us to do our bit to reduce living costs, and one way of doing this is to produce as much as possible and buy as little.

We believe that medical opinion to-day is unanimous on the fact that people are not eating enough fresh vegetables. If we ate more vegetables and less meat our hospitals and nursing homes would not be so crowded as they are to-day.

It is not, however, with this phase of the question that we are at present concerned, but with reducing the cost of living. In the latter connection it will be readily admitted that really good vegetables are dear. They are because the man who produces and sells them has to pay dearly for the goods he buys, and so has to make more on the goods he produces or sells.

Every purchase or service is dear to-day for the same reason. Therefore anything one can grow gives a real saving of cash, and reduces the cost of such commodities to those who have not the means of effecting this economy.

ized, and we append to these notes a table showing how they compare with lean beef. It will be seen that the vegetable kingdom contains, together with cereals, all the necessary ingredients for the building up and maintenance of human life.

As, however, there are to-day large numbers of people who are strict vegetarians, this point need not be argued further. Nor is there need to enumerate the dainty dishes that can be prepared from vegetables alone.

In conclusion, we appeal to our readers to grow and eat more vegetables for the sake of health, with the object of reducing the cost of other commodities to those whose existence is a struggle under present day conditions, and to increase production and so help to reduce living costs under the law of supply and demand.

Readers may consider their opportunity ineffective, but remember it is the grains of wheat that make the bushel, and encourage your neighbor to follow your example.

VEGETABLE FOOD VALUES.

Three kinds of food are necessary to keep the human body in a strong and healthy condition, viz.:

PROTEIN for flesh forming and body building, and to repair the wastage in blood and tissue.

CARBO-HYDRATES (starch and sugar) and FAT, which give heat and energy to the body.

Propagation.	Protein.	Carbo-hydrates.	Fat.	Salts.	Water.	Crude Fibre.
Asparagus, Seed	1.96	2.67	0.24	0.68	93.58	0.87
Beans, French	2.30	7.40	0.30	0.80	89.20	—
Beans, Dried	25.50	46.50	1.50	3.00	13.50	10.00
Beetroot	1.00	15.10	0.10	0.70	81.50	1.60
Borecole or Kale	3.80	9.90	0.90	3.50	82.90	1.50
Brussels Sprouts	4.83	6.22	0.46	0.80	86.00	1.57
Broccoli, Seed	2.05	4.80	0.45	0.75	90.95	1.00
Cabbage	2.92	7.00	0.40	0.87	87.46	1.35
Carrot	1.40	10.80	0.20	0.90	85.00	1.70
Cauliflower, Seed	2.05	4.80	0.45	0.75	90.95	1.00
Celeriac	—	—	—	—	—	—
Celery	1.10	3.30	0.10	1.00	94.50	—
Cress	—	—	—	—	—	—
Cucumber	0.70	2.60	0.70	0.40	95.10	0.50
Endive	1.10	3.10	0.06	0.81	93.00	0.60
Gourd (Pumpkin)	0.80	6.70	0.20	0.70	90.50	1.10
Kohl Rabi	1.30	9.50	0.10	1.00	87.00	1.10
Leek	1.20	5.80	0.50	0.60	91.30	0.60
Lettuce	0.70	4.00	—	1.00	94.30	—
Onion	1.40	9.40	0.30	0.60	87.60	0.70
Parsnip	1.60	10.20	0.20	0.70	86.30	1.00
Peas	7.00	16.90	0.50	1.00	74.60	—
Peas, Dried	24.60	62.00	1.00	2.90	9.50	—
Potatoes	2.10	20.60	0.30	0.90	75.00	1.10
Radish	1.30	5.80	0.10	1.00	91.10	0.70
Rhubarb	0.60	2.50	0.70	0.70	94.40	1.10
Savoy	3.30	6.20	0.70	1.60	87.00	1.20
Scakale	0.40	0.30	0.07	0.29	91.84	1.10
Spinach, Seed	3.15	3.34	0.54	1.94	90.26	0.77
Tomato, Seed	1.30	6.50	1.40	0.80	88.80	1.20
Turnip, Seed	1.1	5.3	0.1	0.7	92.00	0.8
For comparison—						
LEAN BEEF	20.9	—	5.2	1.2	72.2	—

HOTBEDS FOR EARLY VEGETABLES

THE most useful garden should furnish a continuous supply of desirable vegetables throughout the season. This will necessitate some way of starting early plants in a protected place such as a hotbed or cold frame. There the conditions for growth may be closely controlled and better care may consequently be taken of the young plants.

Essentially, a hotbed is a box covered with glass and heated by artificial means. Ordinarily fresh horse manure is the most available and best supply of heat for this purpose to be found on the average farm. After a hotbed is planted, it needs to be carefully ventilated and watered to provide proper conditions for germinating the seed, and it also needs to be carefully watched on account of the danger of damping-off, if it becomes too wet and is not ventilated enough. Also poor ventilation will cause weak, spindling plants. Before removing plants from hotbed, they must become accustomed to the same conditions they will have to meet in the field. This is called "hardening off." It is done by withholding water and increasing the ventilation for about two weeks, until the covers may be left off the bed entirely—all night as well as in the day time. When the plants will stand this treatment without danger, they may be safely put in the field.

In transplanting care must be used not to destroy any more of the small roots than necessary, for the plants take in water through them and are very apt to wilt if any are broken off. Should the tops of the plants have too much leaf surface and the roots be broken to a considerable extent, it is necessary to remove part of the leaves to reduce the transpiration of water and prevent wilting.

AN OIL HEATED HOT BED THAT WORKS

FOR the past two or three years the purchase of suitable manure for hotbed heating has been difficult. So I purchased in January, 1918, a small hot-water heated garden frame, 5 x 8 feet. This is built like a very small greenhouse—a ridge in the middle 28 in. high from the ground with two sashes fitted and hung on hinges on both sides. The sides are 18 inches high and double glazed—as is the entire house. One end is entirely glazed, but in the center of the other, on the outside of the house is built a small box which contains the heating apparatus, a galvanized iron two section boiler holding about two gallons of water heated by means of a two-blaze oil burner. The oil tank that supplies this heater holds a gallon. The heating pipe is 2-inch galvanized iron and runs around all sides of the house and thence back to the boiler. The first season of its use this heater could hardly be called a success. With almost no exception just as the first true leaves were formed, the seedlings would have a mottled appearance thence turning to black and finally withering altogether. I had come gradually to the conclusion that the heater box was too closely connected to the frame as I detected strong odors such as are always associated with kerosene lamps, and by the end of six weeks the glass around the sides of the house was streaked with a brown, greasy substance. Several other objectionable things I found. On either side of the box were six one-inch holes; three at the bottom to supply fresh air and three at the top to allow the old air to escape. Light breezes blown in at the sides and through these holes caused the blazes to jump up and down and to smoke, and this smoke entered the house. Heavy winds blew the blazes out and several times I went out in the morning only to find the fire out and the water cold.

I did remedy this temporarily, however, by sheltering the box. I was never able to keep the temperature where it belonged. The highest night temperature would average 40°. If the outside temperature went below 7° above it would drop to 32° or 34° inside, sufficient to prevent freezing, but not satisfactory. In the daytime 45°-50° on cloudy and 50°-60° with ventilation on clear days was the best it would do—more often much lower than these figures. During the six weeks' experiment there was an average oil consumption of 3 to 3½ quarts a day—on extreme days a gallon. Success was achieved by a few changes. I moved the box six inches away from the frame, extended the pipe to fit, boxed in the space between and packed with sawdust. This effectually isolated the heater. I placed boards over the holes in the box, with holes bored from the bottom up. This made indirect air passages through to the inside, and now, even during an 80 miles an hour gale, the blazes never even flicker. Lastly, the boiler was covered with thin sheet asbestos to stop the loss of heat by radiation in the box. And the top opening (5-inch diameter cup-shaped affair), where the boiler was filled and which last season was left open, I fitted with a tight cover to reduce loss by evaporation. The result of these alterations has been quite beyond my expectations. The air is clear. The blazes never blow out. The oil consumption varies from 2 to 2½ quarts a day at present. And finally, I keep the temperature at exactly the desired point in nearly all weather—52° at night, 60° on cloudy and 65°-70° with air on clear days. The only time I was unable to maintain these figures was during abnormal and extreme cold weather, when the official temperature dropped to 16° below zero here. At that time it went to 42° in the little frame.—CLAYTON G. BROWN, in *Garden Magazine*.

PRUNING EVERGREEN SHRUBS

HOW often do we see choice shrubs spoiled by being cut to pieces by someone who does not appreciate their value! It takes years to grow a good specimen of some kinds, yet a ruthless hand may spoil its beauty in half-an-hour. Some evergreen shrubs are of slow growth, and resent pruning much more than persons who are not thoroughly acquainted with their character have any idea. It is a pity to see fine specimens sacrificed. Again, we often see choice shrubs planted far too close together or too near walks or other objects, so that by the time they are interesting they have either to be moved or cut back, which in the latter case often spoils their symmetry and too frequently prevents them flowering. In planting shrubs, the size to which they will eventually grow should be taken into consideration, and where the space is limited those of slow growth should have the preference. In other instances ample space must be allowed for them to develop. Where pruning becomes necessary it would be far better to have the advice of some expert than to lop off the branches indiscriminately, as each species requires treating differently, and as some kinds resent pruning much more than others, it is necessary for the operator to have a knowledge of the plant, otherwise incalculable damage may be done and many years of valuable time lost.

SUSTAINING MEMBERS

Harry B. Clow, Lake Forest, Ill. (James Wilson, superintendent), and General Richard Coulter, Greensburg, Pa. (N. T. Forsyth, gardener), have become sustaining members of the association.

Making a Start With Bees

HENRY W. SANDERS

THREE things are necessary for the establishment of an apiary, whether large or small. The first is a suitable place to keep the bees, the second is the initial stock of bees and equipment, and the third, and by far the most important, is a knowledge of the natural habits of the bees, and the methods which experience has shown to be the best ones for the purpose of turning these instincts to our use.

The equipment used by modern beekeepers is of such importance in successful bee-culture that we are making a special article on the subject that will appear next month. In this issue we shall consider only the questions of locality and the buying of bees, with some remarks on the inhabitants of the bee colony.

Bees are kept in all manner of places—on the top of tall buildings in cities, in pleasant suburbs, on farms, or away in the wilderness. There are very few parts of the United States where bees cannot be kept with profit, and often beekeepers crowd one another in exceptionally favored localities, thereby cutting down one another's crops, while other places have no bees at all in spite of very fair quantities of natural flowers of the nectariferous kinds. The only test of a locality is to place a hive of bees there, and sometimes in the most apparently unpromising places bees will thrive. They will fly a couple of miles from home, and it is surprising how few of us really know the country thoroughly well within that area.

Many of the flowers of importance are common enough to be well known—the clovers, buckwheat, goldenrod, aster, fruit bloom, dandelion, basswood—we all know these—but there are hundreds of lesser ones, and these collectively sometimes furnish enough nectar to make a small apiary highly profitable.

If in your locality there are abundant flowers of the kinds named above, there are probably also bees—and a visit to a beekeeper will put you in touch with local conditions. If, on the other hand, there are no bees around there may still be plenty of change for you to pioneer, and the first beekeeper in a district often is able to skim the cream of the business before others begin. He can sell bees to others who wish to start, his bees have for a time the unrestricted range of the countryside, and he will be clear of the danger of infectious diseases.

The actual place to put the hives when a start has been made should be somewhere where there is shelter from the cold northwest winds of spring. A certain amount of shade in summer is desirable, but it is not well to locate the hives in very thick bush. Aside from these two considerations it does not matter very much where they are placed. The bees make a line of flight from their entrance straight forward, and if a road or path is in this line people are liable to get stung. In this case it is necessary to interpose a six-foot fence or similar obstacle. This directs the flight upwards out of the way.

If there are bees to be had locally the best way to start is to buy a swarm in May or June. A hive should be purchased and prepared and sent to the beekeeper who is selling the swarm. He will be on the watch, and when the swarm emerges he will hive it in the prepared hive. Then the same night it is carried to the place where it is to remain.

Bees can often be bought to good advantage in old-fashioned hives, like the one shown in the picture. They

will, however, have to be transferred to a modern hive if much success is expected. If bees are bought in this way, either in box-hives, or in modern hives, care should be taken that they are moved at least a mile away, for if a less distance the older bees are all liable to return to the old location and are lost. Along with a swarm or hive a lot of valuable advice can be often be had from the seller of the bees.

Where there are no bees to be had locally, it is necessary to get them in by express. In April or May is the best time to do this, and the seller should be made to guarantee safe arrival or money refunded. A good way to make a start is to get two or three frame nuclei, or bees in two or three-pound packages; but in this case they will not do very much the first year other than to strengthen up for winter. The pound packages are hardly to be recommended for the beginner, and if bees



Bees Can Sometimes Be Purchased Cheaply in Old Fashioned Hives.

can be purchased locally, it is better to pay more and to be sure of what one is getting, besides the fact that local bees will not expose one to the risk of importing disease if the district is clean.

We cannot give a full account in so few lines, but there are one or two facts about the hive that the prospective purchaser must know. We strongly recommend him to purchase a good text-book and go into the matter more fully.

The swarm of bees consists of about 40,000 bees, these being "workers," or undeveloped females. They are incapable of mating, and so do not, under normal conditions, lay any eggs.

The drone bees are males, who do no work, and whose sole function is to mate with the queen. Only one drone ever meets the queen, and he dies as the result. The effects of this impregnation lasts during the queen's life, and she does not again leave the hive after her nuptial flight, except only when she accompanies a swarm to a new home. She lives from three to five years, whereas

workers wear themselves out with labor in a few weeks, though in winter their life is prolonged by inaction till the spring. Drones live only in the summer season, and when the honey begins to fail in the fall of the year, the workers drive them out, and they are seen dead and dying at the doors of their former home. Queens are produced from the same kind of egg that produces workers. Their larval stage is passed within a special large cell, where they are provided with very rich food, causing them to attain full development. The queen is thus a complete female, while the workers, in consequence of "famine rations" in the grub stage, are stunted to the size they remain the rest of their lives.

The brood in the hive consists of bees of both sexes in each of the three stages that characterise all insects, as eggs, larvae or grubs, and the pupa, or chrysalis. These latter are sealed in the cells of the honey-comb, and are known to the beekeeper as sealed brood.

The food of the bees is honey, and that of the brood is honey mixed with pollen from the flowers. Considerable water is used in the brood raising, and in early summer bees are frequent visitors at nearby ponds, horse-troughs, or pumps, and wise beekeepers provide them with water in the apiary, where they can get it without troubling the neighbors.

In the March number we will deal with the beekeeper's equipment.

The Right Care of Old Trees

EDWIN MATTHEWS

A TRUE plantsman will enthuse over a bed of Oak seedlings, a block of young evergreens or a field of Peonies, but the feeling he has toward an old mighty specimen tree is perhaps more akin to reverence than to anything else.

How much our lives are associated with trees! Many of us can clearly recall and visualize certain old trees which in early days held a peculiar charm for us. It might have been an Oak tree with a crooked branch from which was suspended the rope swing, or perhaps an old Apple tree, the flowering of which marked the arrival of Spring and the arrival of whose red-cheeked fruit was a sure sign of Autumn.

The charm of many a private estate or public park lies not as much in the lavish garden of geometrical design, or in terrace, pergola and statuary, as in the monarch trees that have braved the storms of many years and still stand out as living examples of what trees are intended to be. The nurseryman whose business is growing trees by the thousand should get out once in a while to see and study the matured product of that which he is raising. It will not only help him to realize better the importance of his work, but will also give the right perspective and dignity of the ideal: "Every tree a specimen."

Now, while we are agreed that the raising of good trees is a most important function of the nurseryman, of equal importance too is the right care of the full grown tree by the property owner. Unfortunately, in very many cases little care or attention is given the trees after they leave the nurseryman's hands. Congested growth is allowed to accumulate, dead wood which is a sequence of congestion, is permitted to remain and the health of the tree is soon impaired by inroads of decay, insect pests and fungoid disease.

Then, too, the question of feeding trees is more often than not overlooked. It does not occur to the majority of property owners that their lawn or avenue trees stand in need of added nutriment occasionally to offset the unnatural conditions under which the trees are growing. In their natural state trees obtain considerable nourishment from fallen leaves and other vegetable matter which decompose and eventually this material becomes available plant food. With trees on our lawns and avenues these conditions are reversed. Neatness is the password here and while no apparent weakness is seen in the trees for many years, a time comes when signs of deterioration become very noticeable. Like a person with a "run-down system" trees that are half-starved are more susceptible to disease and are less able to stand up against it when it strikes them.

Lack of attention to the important details of correcting

unbalanced growths, removing duplicate leaders, and relieving congested wood while the trees are young are the steps leading up to the point of general debility. Above all, however, is the outstanding fact that many an old tree has gradually been starved to death and no mechanical skill of the tree surgeon will prolong its life for long unless such work is supplemented by liberal supplies of food at the roots.

Trees like the Beech, Maple and Horse Chestnut, whose roots are near the surface may be strengthened by a top dressing of manure applied thickly over the whole area, as represented by the spread of the tree's branches. The snows and rains of Winter will carry the nutriment into the soil to be available for the roots when the period of activity comes around. Just when the tree is most active a little nitrate of soda applied either in water or sown over the ground during moist weather will act as a stimulant and be conducive of vigorous growth. In this way the tree is rejuvenated and by a careful pruning, either by thinning out or shortening back of the branches, a balance is restored between root and head.

In the case of deep rooting trees like the Oak the sod should be lifted and the fertilizer of rich manure which is applied should be dug into the soil, keeping to the outer zone of the tree's spread, since the young feeding roots are those which are farthest from the trunk. The sod is to be replaced, well watered and beaten firmly and evenly into position. The returns for the labor of such operations will be markedly apparent in a wealth of foliage and in the added years of life to the tree.

In conclusion, we should always be guided in the amount of care and expense we give any tree by the worth of the tree itself. Sometimes the pendulum swings from no care at all to most extraordinary and frantic effort to save a worthless tree. If a tree has a future by all means try to save it but why spend good money on trees which are mere apologies for desirable specimens and which, at the most, have only a few years to live? It is far better to end the struggle by taking them out and replanting with young, thrifty specimens that radiate health, that are pleasing to the sight and which will afford pleasure to future generations.—*The Florists' Exchange*.

"It has taken a world calamity, a catastrophe without precedent in history, to remind us of what we never should have forgotten—that the farmer is carrying in his strong arms the destinies of nations; that our welfare, even our very lives, cling closely to the results of his work in the fields, gardens and orchards."

The Value of School Gardens to Cultivate Americanism

ARTHUR SMITH

AT the present time there is not only a generally admitted dearth of first-class, wide-experienced professional gardeners, but also the fact is becoming more and more apparent that the number of educated young men who are taking up the profession are each year becoming fewer.

As there are in this country no horticultural schools in the real sense where a young man can obtain a thorough instruction in the science and practice of gardening, a boy who has had some education in this direction while passing through the grades in an elementary school would have, according to the kind of gardening instruction he received, a more or less good foundation upon which he could himself build further knowledge. But our object is, however, to briefly point out the value in the abstract, of instruction in gardening to all, whatever line of work they may take up in the future, and not merely for those who would become professional gardeners.

The Educational Garden is an essential adjunct to up-to-date teaching, and should be available for every town and country school. We believe that everyone who has had any real experience with school garden work will admit its educational value, especially in cities. Habits of industry are inculcated; where children have individual gardens they get the idea of ownership and its rights. The possession of a garden, with a produce upon it resulting from labor and care, will give a boy a distinct aversion to sharing the results of his labors with a lazy boy who is too indolent to cultivate a garden. He will be more inclined to agree with the idea that "what's mine is my own," and he will demand that the result of his labors shall be properly protected, and naturally will not be inclined to subscribe to any communistic propaganda. Thus the individual gardens, where a child has a plot of ground as his own, are preferable to the community gardens where there is only a party interest and where the personal responsibility of the individual remains undeveloped. In educational gardens, where the work and returns are shared by all, there is little incentive to industry, inasmuch as the more industrious children have no greater share in the returns than the lazy ones.

All broad-minded educationalists who have got away from the narrow, pedagogic ideas, are agreed as to the value of physical training as a means of increasing the mental capacity. Garden work is especially adapted to children of the elementary schools as there are things connected with it within the powers of children of all ages and strength; carried out judiciously it results in the combination of a sound mind in a sound body. Physical exercise in the open air will certainly lay a foundation of good health, while the endless variety of occupations, and the subjects calling for the use of brain power, connected with gardening wisely handled as a means of education, will seldom fail to strengthen the mental capabilities.

This is conclusively proved by the results in connection with children's homes. These institutions invariably have land attached to them for the production of vegetables, etc., for home use, and upon the average, children who are old enough only spend half their time in classroom work, which is the case of those attending ordinary grade schools. But in spite of this and other obvious drawbacks from a pedagogic point of view, connected with these institutions, such as a generally lower type

of children, and that as a rule they have no opportunities for individualistic gardening to make the work more interesting and pleasing, yet the children in these homes pass through their grades equally as quickly and as satisfactorily as those attending the grade schools outside.

Unfortunately, for the purpose of obtaining the fullest results from them, where school gardens have been established in this country the science and practice of gardening has not been made part of the school curriculum. One obvious reason for this is that school teachers have little, if any, knowledge of gardening, and therefore can not teach it. Other countries have been for a long time aware of the value of school gardens, and that the work in connection with them should be part of the elementary school training. In France, a rule has been in force for over twenty-five years that teachers cannot teach any grade above the third until they have passed an examination in the science and practice of soil cultivation and crop production. In Britain the value of school gardens has long been realized, and for some years school teachers, both men and women, have been taking the special examination for the purpose instituted by the Royal Horticultural Society, the number who passed last year being nearly six hundred.

As far as I am aware, there are but few children's gardens in this country which have any direct connection with schools, and where a special instructor is appointed for the purpose of directing the work. This person should be a thorough professional gardener, by which term we mean that he should have a knowledge of both the science and the practice of gardening, so that while any kind of work is being carried on he is capable of showing with his own hands how it should be done and also explain why it should be done in that particular way and why one method is better than another.

At those times when the weather prevents garden work, the person in charge should be capable of giving in a classroom talks to the children upon their work; going over again the whys and wherefores of past operations, and if lantern slides can be obtained of plant structure, etc., children will get a truer and a higher idea of plant life and of the principles underlying it.

While we are not prepared to admit that they do not exist, yet it is true that men equally capable in the use of a spade and of giving a classroom talk are not very common. College graduates who have taken a course in horticulture have a more or less theoretical knowledge of the "why," but as a rule know very little about the "how." There are too few of them who can take hold of any implement and show how to use it, nor show why one tool is better for a certain purpose than another which may be sometimes used for it.

Children who have had a garden of their own and whose work in it has been under the supervision of a man who knows how to garden, are not likely to cultivate the stupid idea that work connected with growing a plant is any lower in the scale of industry than sitting at a desk; on the contrary, the more they know about the soil and the wonderful processes of plant growth the higher will be the pinnacle upon which they will place garden work. Their connection with the concrete work and objects of gardening will cause them to desire for the future a home with a garden, however small, and their minds will not be so likely to respond to the abstract propaganda of radicalism.

A MINIATURE ROCK GARDEN

THE miniature rock garden reproduced in the illustration occupies a space of 11 feet frontage by 9 feet in depth, and was designed to provide an interesting corner where a shrubby border terminated. The water pool which was an after-thought and included after the rockery was built, measures a little over 4 feet. By means of a service pipe dripping water serves to keep the little pool furnished and gives a sense of coolness in the hottest weather.



Courtesy Gardeners' Magazine (English)

Rock Gardening By the Side of a Drive.

Edwin Beckett, who developed this miniature garden at the time of sending the photo to *Gardeners' Chronicle* (English) stated that he was prompted to do so in believing the idea might be useful to owners of small gardens, eager to make the most of them at little cost.

ROCKWORK EDGINGS TO DRIVES

IN England, years ago, one often found a certain kind of rock gardening adapted to the margins of borders that skirted the driveways in modest establishments. Especially was this the case in gardens where the road ran at a lower level than the border or borders, and mostly did this method of gardening find favor where the garden was laid out on a slope, and, consequently, one side of the driveway was higher than the other. The use of rockwork was, no doubt, primarily, to act as a kind of retaining wall for the high border or sloping bank, and then followed a desire to clothe the rockwork with plants and flowers.

To the owner of a rock garden this method of cultivating plants is generally regarded with dignified disdain, but to those who have not the room for a rock garden, but who have a position such as is suggested here, and illustrated on page 58, this plan of beautifying the approaches to the house has much to recommend it. True, the varied aspects and positions needed for a large collection of alpine cannot be provided, but large numbers of beautiful, even though fairly common, spring flowers will thrive in such rockwork. Many dwarf subjects used for spring bedding look more at home on rockwork than on the flat.

THE CAUCASIAN SCABIOUS AND ITS CULTURE

THE Caucasian Scabious, despite the knowledge that there are those who, gardening with hardy plants alone, say they are unable to cultivate it, is one of our finest herbaceous plants. The belief that it is only necessary to plant it in ordinary garden soils and expect the finest results is a mistake at the outset. As a matter of fact, this particular species would appear to abhor heavy retentive soils, though quite at home in some of the stronger loams where these are of a sandy nature and well drained. At the same time, an even greater measure of success follows its cultivation in light and warm soils, and it offers no objection to those largely composed of vegetable matter, or others of a peaty nature. In a word, therefore, the plant may be said to flourish in light, well-drained soils in preference to all others. If such as these are at planting-time enriched by the addition of a good layer of cow-manure a few inches below the base of the plants, so much the better.

In such circumstances the seedling plant will make fine tufts in the course of a season, and in turn yield in the following year a rich harvest of flowers of which any gardener would feel justly proud. In color, beauty and refinement the Caucasian Scabious is one of the indispensable, one that no good garden should be without: hence it is suggested that the soil be made to suit the plant. The delicate lavender blue of its flowers is quite a rarity in the garden at any season, and few are more highly prized in the cut state.



Courtesy Gardeners' Magazine (English)

A Miniature Rock Garden and Water Pool.

Apart from the important question of soil, that of raising the plant periodically from seeds merits close attention, for more than one reason. On light and warm soils this handsome Scabious is usually a good perennial. On heavy soils it is not so. Then, again, because of its abundant and profuse flowering, the stools become exhausted; hence the need for replacing them with others of a more youthful and vigorous nature. Seeds vegetate quickly and with comparative certainty, and afford the readiest means of propagation to amateur and professional alike. The seeds

should be sown preferably during the autumn or winter months, so that, vegetating in the earliest days of Spring, there is still a full season ahead for the plants to make good growth. These would be best in a cold frame. Seeds sown in February or later should be given greenhouse treatment, a temperature of about 50° being ample. In either case the seedlings should be potted off singly when large enough to handle and grown without a check from the start, so as to be ready for their permanent quarters in the open ground early in May.—*Exchange*.

CULTURAL NOTES ON ANTIRRHINUMS

THERE are three distinct classes of Antirrhinums: dwarf, medium and tall, ranging in height from six inches to two feet or even more. All are worth growing. They make a fine display among the borders, and the dwarf variety furnishes a nice edging plant. In the sowing of the seed it is advisable to sow in pans or shallow boxes, with a layer of some rotten manure over the corks. Sow the seed very thinly and cover with a pane of glass. This tends to keep in evaporation and thus result in a quicker germination. Cover the seed with just enough fine soil to hide the seed, and gently press the surface. Place the pans or boxes in a temperature of 65 degrees to 70 degrees while germinating. Immediately the plants are large enough prick off into plant boxes, and as growth ensues, gradually harden. Private gardeners, who do not grow for commercial purposes, might shift the plants from the seed pans into shallow boxes. When they have shown the third leaf grow them on in three-inch pots, as they make a large plant for the bedding out season, and at the same time ensure a longer blooming period. February is the most important month for sowing the seed. No time should be lost in securing a true strain of seed where the aim is to get the best possible results from these flowers.

In the growing of these plants under glass they require not too rich a compost, but more feeding, according to the length of time space can be afforded to them. Encourage the plants by straight growths, cutting away weak laterals. Spraying is necessary to keep down fly, and airing must be given freely on favorable occasions or growth will be on the weak side.

Antirrhinum can also be secured by cuttings, and are easily rooted in sand. This process should be resorted to where special colors are needed, or in the selection of any true variety. Insert short, not long, cuttings as it is easier to keep them up so that they cannot flag.—*Canadian Florist*.

ARTEMISIA LACTIFLORA

THIS plant is comparatively new to our gardens, and is one of the many fine things introduced from China by Mr. Wilson. It has proved a great acquisition to the herbaceous border not only for the beauty of the individual plant, but for the length of time it remains in bloom. From early in August, until the end of September, its elegantly cut foliage terminating in light and graceful panicles of creamy white flowers, reminds of the old *Spiraea aruncus*.

I consider it one of the most attractive and desirable plants for the garden when used for grouping, or as "foils" when planting for color effect.

Planted as a background for *Tritoma Pfitzerii*, or late Phlox, Zinnias, etc., the feathery plumes make a fine contrast to the more stiff plants, and tend to main-

tain the proper balance. It grows from 4½ to 5½ feet high.

It is easily propagated by divisions which can be done in the Fall or Spring; personally I prefer Spring.

This plant is presumably hardy, but of course it depends to a great extent on the position, and the exposure it may be subjected to. It often happens after sudden thaws, when robbed of nature's blanket of snow, the temperature may fall to zero; then if caught without adequate protection, it is often fatal to the green foliage. Therefore, I would advise removal in the fall to sheltered quarters. These little attentions well repay the little trouble taken. When used for cutting it makes a fascinating decoration, especially if used with such subjects as the long spikes of *Delphinium*. It is easy of culture doing well in ordinary garden soil.

AN ARBOREAL SLATTERN

WHEN the Park Board forbade the planting of box elders along the streets of this town, (Minneapolis) they did a good day's work, well seasoned with clear foresight and wise retrospect. The only flaw in the proceedings was the failure to limit the life period of every tree of that variety already on the street.

The chief charge against this tree weed is that it has no fixed purpose in life, no wholesome pride of performance, no sense of its own unworthiness. It is cursed with a boorish forwardness, and a painful lack of that nice sense of dress common to trees of better breeding. A poor tramp among the matrons of the forest, it is endowed with a shocking fecundity and its offspring with a vulgar vitality.

The pine, now, for instance, is a purposeful dignified and self-respecting tree. Its aim from infancy to age is to build its central shaft. Forgetting the things that are below, it presses upward. Nothing stops its terminal bud in its direct reach for the sky; and no lower limbs retard the building of the one well determined bole. It is this quality that has made the pine and its kin, the most useful tree on earth.

The oak aims to endure; the maple to shape a noble head; but the weak minded, ungainly, sprawling box elder has no commercial ambitions. It is content to squat and sprawl.

The box elder leaf has no outstanding character. Men do not honor it. But the maple leaf has reached regimental honors in the United States Army; and the oak leaf, a commander's order in the Navy. Art loves to twine these two leaves into its best ornamentations. But who ever saw even a Digger Indian adorn himself with the trilling foliage of the box elder?

Autumn gets no responsive tint from this tree's fading summer skirt. Drab, frayed, flabby, it waves no gay kerchief in farewell to the departing year. Nor does it lay its garments down with a will, as do the linden and the poplar; nor hold grimly on to them, as does the red oak.

Half-heartedly it strips itself of a part of its shriveled covering, leaving the raveled rags to flap in the winter wind, like the weather beaten remnants of a cornfield scarecrow.

Yet this cheap tree persists. It rushes in where oak trees fear to root. It immodestly offers to repopulate the forests where its betters have been slain for their wealth; for knowing nothing, it fears nothing. Verily, in the woods as in the rest of the world, "the poor ye have always with you."—*Minneapolis Journal*.

The Month's Work in the Garden

JOHN JOHNSON

THE work of another season now demands our attention. Although just what and how much can be undertaken must be governed by local conditions and the resources at the command of the individual. Ambitious gardeners, particularly those having restricted glass areas, always find this a month of impatience and restraint. While seed sowing may certainly be done more lavishly than was either possible or advisable a month ago, we feel bound to offer a word of caution—everything sown now will soon require more room, therefore make ample provision for carrying all safely through till planting time.

The wide-awake gardener will not be surprised by the weather, but will provide for an emergency. He will sow only the kinds most in demand and those which can be brought through without loss. The man with a greenhouse has indeed much in his favor with regard to early sowings, and yet we have no hesitation in saying that even without this facility much can be accomplished with the aid of hot beds alone. The writer has cut fine head lettuce from the hot bed the first week of March in the latitude of New York. This crop, perhaps, is not quite so exacting in its requirements as many which might be sown now, yet it will be borne in mind that hot bed culture becomes less hazardous as the season advances, for the sun is fast gaining power and there are few days from now on when the sash must remain covered. However, it is not superfluous to assert that with the limitations which hot beds alone impose, the patience and skill of experienced gardeners are sometimes tested to the utmost during the usually severe weather of the next six weeks, and as these notes are addressed particularly for guidance to the less experienced, we explicitly caution the grower against attempting more than he feels can be brought to a successful issue. On the other hand, the earliest possible production should be aimed at, and it is the duty of the cultivator to devise ways and means to that end as far as may be in his power.

Hotbeds.—After the preparation of the spring seed order the making of hotbeds is perhaps more interesting and certainly quite as important as anything else to be done during the month. We have from time to time outlined instructions for making a lasting hotbed and cannot depart from the advice already offered. A mixture of fresh, or reasonably fresh, horse droppings and litter is probably the best material for this purpose. Forest leaves are to be recommended where a very mild bottom heat is looked for, but it cannot be claimed that leaves are capable of generating heat to the same extent as manure. At this early date horse manure must be regarded as indispensable in the formation of hotbeds, while the best we can say of leaves is that they are good component material. Used in conjunction with manure, leaves are very satisfactory. The most important consideration will be to have the material in a perfectly fit condition beforehand. It should be neither too wet nor yet too dry, a condition best determined by occasionally turning the mass prior to making up the bed. When violent heating has subsided and the material appears evenly moist throughout but not soggy, make up the bed. The depth to which the bed should be made will vary with local conditions of weather and, of course,

must vary to meet certain requirements. If an atmospheric temperature of 55 to 60 degrees is required during zero weather the bed should be about 20 inches deep when well trodden. Beds, however, of less depth are less difficult to control, and our advice would be to make a bed from 12 to 16 inches deep and use ample covering on the sash. With beds of great depth there is always a danger of over-heating when outside conditions are such as to render ventilation almost out of the question. If crops like carrots, string beans, lettuce, radish, etc., are to be grown, it will be necessary to cover the bed six inches deep with a fairly rich, porous compost, and sow the seeds in drills. On the other hand, if the purpose of the bed is for raising stock to later transplant in the garden, use seed flats or pans. In the latter instance it will be unnecessary to cover the bed to any great depth with soil. Cauliflower, cabbage, leek, onion, celery, tomato, egg plant and pepper are among the vegetable seeds to be sown now. Annuals, and others so called, used for bedding purposes and for cut flowers, may be sown during this month and next.

Among the kinds which should be sown as early as possible are: Begonia (both fibrous rooted and tuberous rooted varieties), Vinca rosea, Pentstemon, Carnation, Canna, Pansy, Abutilon, Grevillea, Verbena and Lobelia. Fibrous rooted begonias are used more extensively for bedding purposes than the tuberous rooted variety. The parent of this bedding group, *Begonia semperflorens*, is a native of Brazil. The plant is perennial in habit, but may be successfully treated as an annual, as may its many hybrid forms. The seeds germinate freely in a temperature of 65 degrees and should be sown in pans of finely sifted loam, peat, and sand. Press the soil very evenly in the seed vessel and sprinkle with water before sowing the seed.

The seed of Cannas is extremely hard and germinates very slowly unless assisted. The best method is to first soak the seed in hot water for a few minutes before sowing. Cover the seed one-half inch deep and plunge the pan in the hotbed.

Abutilons and Grevilleas, although not strictly bedding plants, make handsome specimens for dropping in flower beds. The seeds of both kinds germinate unevenly, but when the seedlings do appear they are easy to manage. It should hardly be necessary to say that all seeds should be sown thinly and yet there are so many gardeners who do insist on emptying the contents of a seed package on a given space under any and all circumstances, that fresh warning is given. This wanton practice often results in wholesale loss as the seeds germinate, since it is almost impossible to escape "damping." Even is the seedlings do not entirely succumb in this way they become weak and attenuated. Unduly elongated at the start, subsequent growth always proves more or less disappointing. Better by far grow a few plants uncommonly well than court failure by overcrowding.

Snow may be allowed to accumulate on and around cold frames in which plants are in a frozen condition, but plants in hotbeds and heated pits must have light and air.

Push forward the propagation of bedding stock as advised in last month's notes. Plants of Fuchsia, Geranium, Abutilon, or Heliotrope raised from cuttings last autumn

and intended for specimen bedding stock should be kept growing freely. Give these plants a shift into a size larger pots before they become root bound. Any pinching or disbudding necessary to proper development should have rigid attention from now on as growth becomes more active every day. These and several other forms of specimen plants fit many schemes of adornment, relieve monotony, and are at once objects of beauty and charm.

Inspect fruit and vegetables in storage at regular intervals. Decaying specimens should be removed to prevent contamination, and admit ventilation to the cellar or storehouse when weather permits.

Asparagus, seakale and chicory force readily now. Maintain a succession of these excellent vegetables by replenishing worn out beds with new plantations and treat as advised in previous notes. Prune outdoor grape vines and bush fruits this month and gather up all trimmings as soon as the job is done.

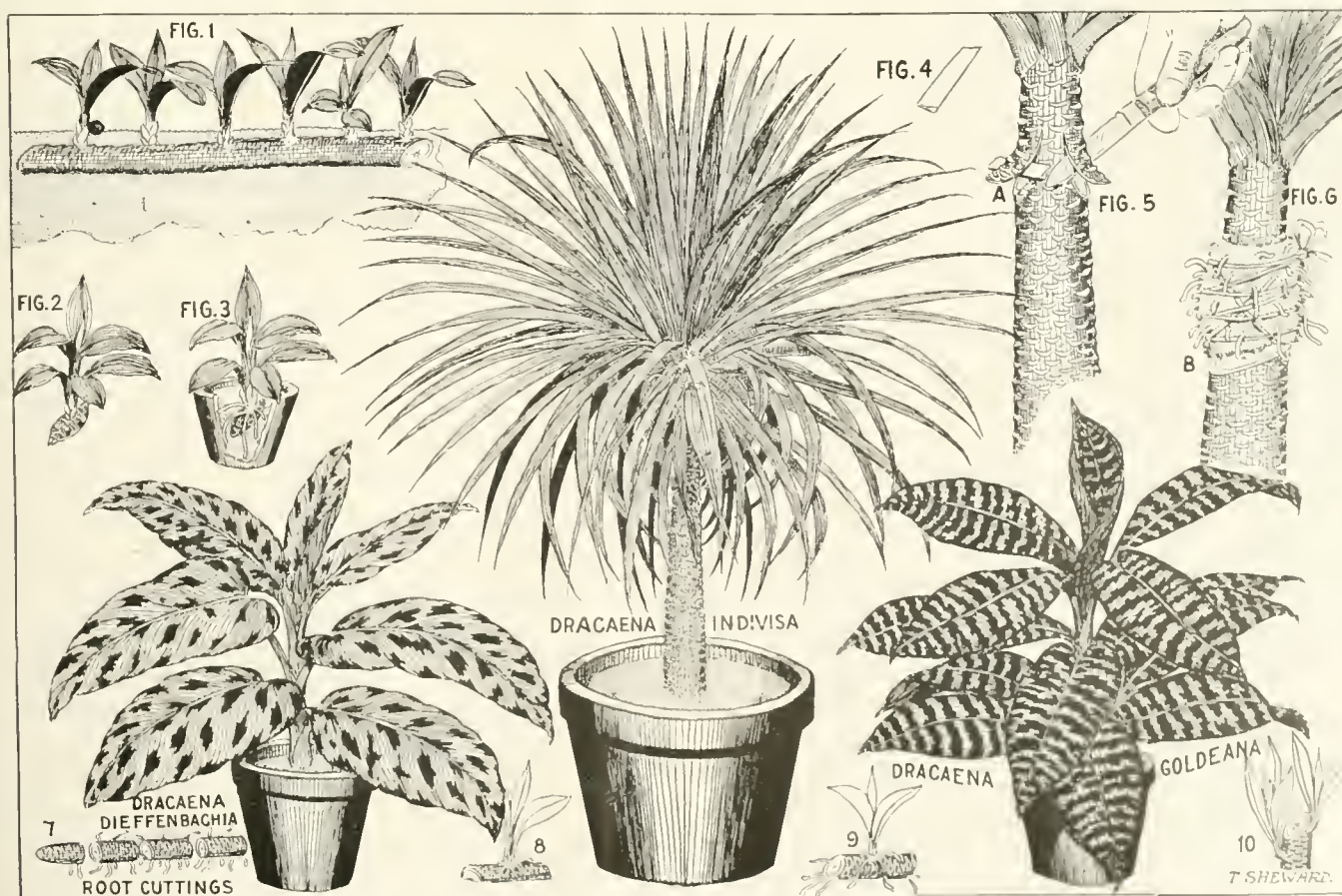
Look over the orchard and shrubbery for traces of San José scale, which is probably the most injurious of all insect pests: don't delay the spraying of infested specimens a day longer than is absolutely necessary. Cuttings of desirable evergreens may now be rooted in sand over mild bottom heat. They root readily, take up little room, and are always interesting.

The Dracaenas

T. Sheward

The *Dracaenas* are some of the most useful ornamental foliage plants for greenhouse decoration. All like a warm, moist atmosphere. *D. Indivisa* is the best known of the species, being much used as centerpieces for hanging baskets and vases. *D. Indivisa* is a native of New Zealand, *D. Goldiana* from tropical Africa. A compost for potting the *Dracaenas* would be one-third leaf-soil or peat and plain loam. Propagation is by layering in moss or cuttings, seed and root cuttings. Fig. 1 shows the stem of a *Dracaena* covered with cocoanut fiber in the propagating house and young shoots starting from the joints. These are cut away (Fig. 2) and inserted in sand (Fig. 3), where they will soon root and can be potted into larger pots. All that is necessary to cause the old cane to break into growth when in fiber is heavy syringing every day. The old stems can be cut up, as shown at Fig. 8, if desired and covered with fiber (or

moss) till the eyes break into leaf (Fig. 8). By cutting up the thick roots (Fig. 7) into pieces one inch long, and forming root-cuttings which should be started in fiber small plants (Fig. 9) are quickly formed. Large pieces can be rooted (the whole top of very leggy specimens) by layering. Make two cuts as shown at Fig. 5 and insert a piece of wood (Fig. 4) under the cuts ("A" Fig. 5) to keep them open till rooted. Tie sphagnum moss around the cut and keep moist till roots form (Fig. 6), when the whole piece can be cut away and potted ("B" Fig. 6). A layering pot filled with sphagnum moss could be used both ways with equal success. Cuttings will break from the old stem (Fig. 10) and may be cut away and rooted in the sharp sand in the well arranged propagating house. Where seeds are used (*D. Indivisa*) a box, filled with sandy peat and covered with a sheet of glass, is used.



The Month's Work in the Greenhouse

HENRY GIBSON

FORCING bulbs that are rooting outdoors under a covering of ashes or other material will be hard to get at during the severe weather we are experiencing at this writing, and extra care will be needed to avoid breaking, both pots and plants. In attempting to get the frozen covering off one is very likely to break a good many of the young growths thus preventing them from flowering. So long as the pots or flats can be loosened, and taken indoors, it would be well not to trouble about the covering until it has had an opportunity to thaw out, when it may be readily removed without doing any damage. Most gardeners have a system of their own to work upon them bringing in the bulbs to maintain a succession, yet wherever it is at all possible it will be found good practice to get them in during moderate weather, even if one has to get in a few extra flats in order to carry over an extreme cold spell.

It is just as well to get any of the early flowering shrubs that are to be forced under way as soon as possible now. A temperature of 45 degrees is enough to start them, and if they are to have any hard forcing they should have it at least ten days before they start to open their buds. A moderate supply of moisture at the roots, and frequent syringings overhead, will soon bring about an all round swelling of the buds, and the starting of active root fibers. A gradual rise to 60 degrees, with 5 to 10 degrees higher on bright days, will finally fix the even course of regular forcing, promote luxuriant growth, and perfect development of foliage and flowers. Should the condition of the plants indicate that they are not going to be in flower just when they are needed most, the temperature may well be raised every ten days or so, until 70 degrees is reached at night. When the flowers are fairly well out a drop to 50 degrees will add materially to their keeping qualities.

While the propagating bench is kept pretty well occupied with bedding plants, it would be well to give a little space to a batch of *Bouvardias*. They are useful and beautiful plants and are easily grown. Root cuttings are to be preferred to young top growth. Some or all of the strong roots of the old plants are cut up into pieces of half an inch or more in length. These are strewn upon the propagating bench, slightly covered, kept moist, and somewhat close. After the appearance of the young growths, sashes or anything used in covering the bed may be dispensed with if a steady heat can be maintained without them. No shading is needed while the cuttings are in the sand. When the growths have attained a size large enough to be handled with facility they may be potted into small pots, where they will remain until planted out in a favorable spot in the garden when all danger of frost has passed. By giving the plants a warm house, plenty of light, and frequent pinching back, they will grow into nicely branched plants with firm root-balls that will hang together when lifting for the final potting next Fall.

If sown at once Cannas from seed will flower by the middle of Summer. A very practical way of securing a quick germination is to soak the seed for 24 hours in warm water, then with a pair of pliers slice off a piece of the hard covering. Sown in flats, simply as you would peas outdoors, covered with half an inch of sand, and placed where they will get a strong bottom heat, at least

25 per cent of the seed will grow quickly. The others will come up at intervals. They need plenty of strong heat, and when they are large enough to handle they may be potted, grown in a warm house and shifted into four- or five-inch pots as their vigor may determine. About the middle of June they may be planted out.

Clumps of the old Canna roots dug from the flower beds last season may now be taken out and cut ready to be started in pots or flats later on.

Stock plants of *Chrysanthemums* should be placed in a temperature of 45 degrees, with all possible light so that they will begin to furnish material for cuttings. The roots of any varieties of *Dahlia* that one is desirous of increasing the stock of may now be planted in a bench, where they will soon throw up a supply of cuttings.

The first batch of *Carnation* cuttings should be rooted by this time and ready to go into pots. They should be potted up at once for if left in the sand their vitality soon wanes. This is far more so with *Carnations* than with any other plants that are propagated today. A *carnation* plant, once allowed to get stunted in the sand, will remain so for some time to come and is far more subject to disease of all kinds than is healthy vigorous stock that has been kept growing right along. Don't make the mistake of using highly manured soil for the first potting: the little roots are not yet able to utilize the plant food at this time, and if you add a small proportion of well decayed manure you have done enough. A clean sweet fibrous soil is more important than an excessively rich one. The young plants will do well enough in a temperature of 48 degrees, and let the bench be a sunny one.

Pelargoniums should be kept growing from now on. Give them a sunny position, and a night temperature of about 45 degrees. Feed them liberally with liquid manure, together with alternate top dressings of Clay's fertilizer, or other concentrated plant food, which will assist in making the wood firm and cause the plants to flower freely. When they are very badly pot-bound they should be repotted in a compost made up of two-thirds fibrous loam, and one-third dry cow manure, with enough sand to make the whole porous, and a little fine bone meal. Drain the pots well, and pot firmly leaving a good margin at the top to hold water. Green aphid is the arch enemy of *Show Pelargoniums* and should never be given any quarter. Not infrequently we see what were otherwise very fine plants simply alive with these pests. A heavy smoking is usually given, which more often than not removes the flowers as well as the aphid. The point is to fumigate light and often. Keep the plants spread out, and as light as possible, and on warm days give them a syringing overhead. Treated thus one can expect to have healthy, stocky plants that are a credit to the cultivator, and well worthy of the attention bestowed upon them.

After the middle of the month a batch of fancy leaved *Caladiums*, those gorgeous colored foliage plants, may be started up where they are likely to be needed for decorative purposes in the conservatory. About as expeditious a method to employ in starting them as any is to place them in flats on a layer of sphagnum moss. In this way they can be placed close together. Fill in and cover them all over with about an inch of moss, then place them in a house where they can have a temperature

of 65 to 70 degrees with a brisk bottom heat, for they like both top and bottom heat to make a good start. Watering should be with care until they get a start, a moderate moist condition suiting them best at this stage. When they have made a fair amount of roots they may be potted into 3- or 4-inch pots affording them ample drainage. For a compost, three parts turfy loam, two parts leaf mold, with well decomposed cow manure, and enough sand to make the fixture porous suits them admirably. For extra sized plants keep shifting them until they are in 5- or 6-inch pots. Place them well up to the glass, and as the sun gains in power during the day, they will need some shade. Watering through all stages of growth needs to be done with good judgment.

Among the many seeds that are to be sown at this time two or three are worthy of more than passing mention. *Pennisetum longistylum*, is one of our most effective border plants and not seen nearly as much as it deserves to be. When used as an edging to a bed of Cannas it gives a finished appearance to the bed that cannot be obtained with *Salvias*, *Coleus*, or any of the plants usually made use of. To get good plants for this purpose seeds should be sown early, and grown cool. They

require to be potted off singly, and never allowed to become crowded.

Eupatorium Fraseri, is a plant that can be used like *Stevia* to go with other flowers. It grows about two feet high, and when kept free from weeds will thrive almost anywhere. *E. caelestinum* is botanically speaking not a *Eupatorium*, but a *Conoclinium*, and is even a better plant than *E. Fraseri*. It is a late flowered perennial 1½ feet high with heliotrope colored flowers and very hardy. It makes a useful plant for low borders, and if grown in pots and kept pinched back, with the protection of a cold frame, or a violet house temperature will make a useful addition, to our list of late flowering plants either for decorative or cut flower purposes. Last fall in New Jersey we saw this plant used as an edging in a bed of tall growing perennials, in full bloom the last week in October—the admiration of all who saw it. Seeds sown now and later transplanted to flats and put into permanent quarters in Spring will result in some flowers this season, and more next. It is also easily propagated from cuttings, and these, inserted in the sand now, may be treated as seedlings.

Begonia Gracilis

HENRY J. MOORE

THESE are perhaps no more useful Begonias than the *gracilis* varieties, and as they are easy of culture their beauty may be enjoyed by growers practically all over North America. As bedding subjects, they are equal to any, and when their usefulness for this purpose is past they may, during Fall, be removed to the greenhouse or window where they will flower for many weeks, and be a source of beauty. Indeed with careful attention in cultural matters their pink or white flowers may prove a source of cheer all through the long Winter.

Culture.—The *Begonia gracilis* varieties may be raised from seeds sown during August or September for Spring flowering in the greenhouse, or during late February in a greenhouse or warm window with a temperature of 65 degrees Fahrenheit, for bedding during late May. A soil composed of well rotted loam one part, leaf soil two parts, and sand one part, carefully mixed and finely screened is excellent for the seed pans. A heavy soil sometimes used by householders for this purpose is often the cause of failure with the seedlings. Others defer sowing till mid-April, which is too late for bedding, even under the most favorable conditions, and court failure in this way.

Afford drainage to the pans by placing broken crocks one inch thick in the bottom. Upon this layer place a handful of the coarse screenings from the loam, and finally fill with the screened soil to within one-half inch of the top. Make the soil fairly firm, and leave the surface slightly convex so that moisture will drain to the sides. This is good practice when sowing all kinds of Begonias, as they are very susceptible to "damping" when sown on purely flat surfaces. Soak the soil by immersion in water, before or after sowing the seeds, but do not disturb the surface. Do not cover the seeds with soil. Place a pane of glass over the pans and exclude the light by means of a piece of paper until germination takes place, removing it only when necessary to immerse the pan when the soil shows signs of dryness.

The *Begonia gracilis* varieties show signs of germination in less than two weeks, and in five may be pricked off into larger pans or shallow boxes about an inch apart.

This will be about the first week in April. During early May pot the seedlings singly into four-inch pots. Place them in a greenhouse, window, or garden frame, with a temperature of 60 to 70 degrees, and by the end of the month they will be ready for bedding.

From June until mid-October the Begonias will furnish a wealth of beauty outdoors, and when the weather becomes too cold for growth, remove them carefully from the soil and pot them according to their size into six or seven-inch pots in the soil previously mentioned, but which is only screened through a one-half-inch screen. Soil finer than this is not desirable for the purpose. Place the plants in the greenhouse and from Christmas onward with proper care they will prove a valuable addition to the stock of ornamental plants. If placed in the window of a well lighted and warm room, watered when necessary, and manured with household ammonia, one teaspoonful to a quart of water, or with nitrate of Soda, one-quarter ounce to each gallon of water, good flowering growth will be promoted, the plants be kept in excellent health, and in a condition to again plant out in the garden beds with the advent of Summer.

The Begonias in question may also be raised by cuttings. One large well grown plant may furnish more than twenty, and if these are placed in beds of sand in the greenhouse or in pots in the window during Spring or Fall, a large number of plants may be raised. The person with the advantage which a greenhouse affords may propagate the plants successfully at almost any time, but householders will be well advised not to attempt to raise them either by means of cuttings or seeds except in Spring, so that they will not have to carry them over winter in the cutting or seedling stage. Rather the windows should be filled with mature plants lifted from the garden, and which are objects to be admired during the long winter months.

Think about yourselves; about what you want, what you like, what respect people ought to pay to you, what people think of you; and then to you nothing will be pure.—*Charles Kingsley*.

Fruiting of Apple Trees Every Other Year

MANY varieties of apples and pears for various reasons bear only every other year. This condition is not uniform the country over, but is more common in the fruit sections of the North and East than in the South or West. The same is true but to a less extent of the stone fruits. The causes are somewhat varied but are mostly the result of the climatic environment in which the trees are grown. The biennial bearing habit is apparently not an inheritable trait, but when it once becomes fixed in the life of the individual there is little that can be done to change it.

In the fruit sections where the climatic conditions favor the setting of a crop every year, the biennial habit does not exist. In those sections where frosts and rains interfere with the set of fruit, the life

If the trees are properly pruned and the fruit thinned, while they are young the habit can be prevented to a large extent. When a heavy crop sets on a young tree, it should be thinned enough so it will not be overburdened and can develop fruit buds while maturing the crop. If frost destroys the blossoms, then the grower should reduce the vigor of the trees by cropping the orchard or by giving less cultivation. A heavy pruning in the years when a crop is expected will tend to reduce the amount of fruit and increase the wood growth. Early summer pruning during the crop year will often stimulate fruit buds. As the trees grow older the habit becomes fixed and it is hardly worth while to attempt to correct it.

That a heavy crop actually reduces the number of blossoms formed for the next year can readily be proved by observing and counting those that appear through two or three years. Instances are not uncommon, where scarcely a dozen blossoms developed on trees that matured a heavy crop of fruit the preceding year. In the particular case illustrated in the accompanying photograph, one-half of the tree had been grafted to a Gravenstein while the other half was of the original variety. For some unaccountable reason each half of the tree chose opposite years for their heavy crop. In the spring it presents an odd appearance by one-half being in heavy bloom while the other half scarcely develops a single blossom. The next year the process is reversed.

This tree is now about 25 years old and to the writer's personal knowledge has behaved as described for the past five years. No certain explanation as to the original cause of the condition can be given. As there is some slight difference in the blooming time of the two halves, it is possible, that frost may have come at such a time as to destroy the fruit on one side while the other escaped. It is interesting for two reasons. First, that it indicates that the formation of fruit buds is not wholly a question of nutrition. Second, that the food supply of the trees is directed first to the needs of the maturing crops.—*The Journal of Heredity*.

THE FLOWERING DOGWOOD—CORNUS FLORIDA

IT is perhaps not necessary to call attention again to this tree which in recent years has been planted in considerable numbers in those parts of the north-eastern states where it is hardy, but the Flowering Dogwood has been exceptionally beautiful this year, and its value for the decoration of the parks and gardens of eastern North America cannot be too often insisted on. *Cornus florida* "composes well," as landscape gardeners would say, with the vegetation of eastern America, that is, where it is planted under our native trees or along the borders of natural woods it never looks out of place. In spring it enlivens the forest with sheets of the snow white floral bracts which surround the heads of small yellow flowers. In October the leaves of not one of our smaller native trees assumes more beautiful shades of crimson, scarlet, orange or yellow, and as the leaves change color gradually leaves which are still green are often mixed with those which have become brightly colored. The autumn beauty of the leaves is increased, too, by the contrast in the colors of their upper and lower surfaces, for only the upper surface changes color, the lower retaining until the leaves



(Courtesy of Journal of Heredity)

Gravenstein apple graft on a Russian type. The arrow marks the point of union. One year the Gravenstein branch is loaded with blossoms while the rest of the tree is comparatively bare. On alternate years these conditions are reversed.

processes of the tree are thrown out of balance and the tree gets into the habit of over-working one year and recuperating the next. A normal tree develops fruit buds for the next year at the same time it is maturing the present crop. When there is no fruit to mature, an over supply of fruit buds is prepared for the next year. When the time comes, if conditions are favorable, a heavy crop sets and the tree puts forth all its efforts to mature it. This causes such a heavy drain upon the energy of the tree, that no fruit buds are formed for the next crop. After a few years the habit generally becomes fixed and the tree continues as a biennial bearer.

fall the pale or nearly white color of Summer. In the Autumn, too, the clusters of bright scarlet fruits add another charm to this tree which is often short-lived, for birds devour the fruit almost as fast as it ripens. The conspicuous gray flower-buds which open the following Spring are formed in the late Summer and add to the beauty and interest of the tree during the Autumn and Winter. A variety of *Cornus florida* with red floral bracts was found in Virginia several years ago and has been propagated and sold by American nurserymen. When in flower it is a showy tree but lacks the charm of the normal species. A variety of the normal form with pendulous branches is in the Arboretum collection but has no particular interest or beauty, and a form with flower-heads surrounded by a double row of bracts, which was a good deal advertised a few years ago, has little to recommend it. Beautiful as it is the eastern Flowering Dogwood is surpassed by the species of the northwest coast region. *Cornus Nuttallii*, which is a tree sometimes seventy or eighty feet high with heads of bracts five or six inches across. *Cornus Nuttallii* grows in damp woods in the shade of large coniferous trees, and it is difficult to keep it alive beyond the limits of its native forests. It has never succeeded in the Arboretum and has flowered in Europe in only a few gardens. The Japanese Flowering Dogwood, *Cornus kousa*, and its Chinese variety are hardy and handsome little trees which flower later in the season than our native species, with which they do not compare in beauty of flowers, foliage or fruit.—*Arnold Arboretum Bulletin*.

STREPTOCARPI AND THEIR CULTURE

SEVERAL raisers have played a part in the production of the present-day race of *Streptocarpus* which now in popularity vies with the *Gloxinia*; indeed, by some the *Streptocarpus* are preferred to the others, though on this point opinions will, of course, differ. In place of a practically unknown and undeveloped race of plants, which was the case a little over a generation ago, we have now an exceedingly useful group where a display of flowers has to be kept up at all seasons.

The best forms now are exceedingly floriferous, with compact masses of large, bold blossoms. The range in color is very great, varying from pure white though different shades of pink and carmine to deep red or crimson, while in many the blue, violet and purple tints are delightful. Not the least attractive are those of a pure white, pencilled mainly in the throat with carmine or purple. A feature in favor of these hybrid kinds of *Streptocarpus* is that from seed sown in heat early in the year, plants may be obtained which will flower throughout the Summer and, under favorable conditions, well on into the Autumn. The flowers last well in a cut state, and for some kinds of decoration are very useful. If cut with stems as long as possible, they are very light and elegant in appearance.

Seeds should be sown during the first half of February, as then the young plants will have a long growing season before them. Whether sown in pans or pots, the utmost care must be taken in carrying this out, as the seeds are very minute, and the seedlings at first correspondingly delicate. The pans or pots must be quite clean, well-drained and filled to within a third of an inch of the rims with a good light compost. Most gesneraceous plants are very fond of a liberal quantity of leaf-mold in the soil they grow in, and the several forms of *Streptocarpus* form no exception to the rule. A suitable compost in which to sow the seeds may be made

up of one part loam to two of leaf-mold, and about half a part of silver sand. It is a good plan to sterilize the soil before use, after which it should be sifted through a sieve with a quarter of an inch mesh, putting the rougher portions that do not pass through the sieve on one side to place immediately over the crocks. The soil should then be pressed down moderately firm and made quite level.

Before sowing the seed, the soil should be moistened either by watering through a very fine rose or by standing the receptacle nearly to the rim in a vessel of water, which will enter through the hole in the bottom and thus wet the whole of the soil without disturbing the surface. Placed then in a shaded part of a warm structure; that is, where a temperature of 60 to 65 degrees is maintained, the young plants will in due time make their appearance. Until this happens a pane of glass should be laid over the pot, in order to maintain a uniform state of moisture. The seed is so minute that when it is sown some cultivators do not cover it at all except with the glass, while others sprinkle just a little dry silver sand on the surface. It is most essential to take care that the seed is sown very thinly. It may be noted that it sometimes germinates in a rather irregular manner. When the young plants are large enough to conveniently handle, they may be pricked off into pans or boxes, using much the same kind of compost as that in which the seeds were sown. From the delicate nature of the young plants this must be carefully done. The temperature of a warm house and a shady spot therein are necessary for the young plants. When sufficiently advanced, they may be potted off singly into 2½-inch pots, from which the strongest growing plants may in due course be shifted into pots 4 inches to 4½ inches in diameter.

During the Winter the plants should be put in a temperature of 50 to 55 degrees, and the soil kept moderately dry, though on no account must they be parched up, as, unlike *Gloxinias*, they do not form a solid tuber. Then, about the end of February or early in March, they may be potted, equal parts of loam and leaf-mold with a little sand being very suitable. Under the influence of additional heat they will soon start into growth, when they may for the Summer be removed to the greenhouse. An occasional stimulant will at that time be beneficial, and, in order to prolong the flowering period, all the old blooms should be picked off unless seed is required. After the second year's flowering the plants may be thrown away.—*The Garden* (English).

ALWAYS SOMETHING TO BE THANKFUL FOR

There's something to be thankful for, no matter how things go—
In Summertime for fruit and flowers, in Wintertime for snow.
There's something sort of pleasant happening to us every day,
And life's a perfect picnic if we look at it that way.

There's always something pretty for our weary eyes to see—
The glory of the sunset or the blossoms on the tree.
And always something tuneful for our tired ears to hear—
The children's voices chirping or the robin's music clear.

There's always something ready for our willing hands to do—
Some halting steps to help along, some job to carry through—
No chance to be kicking when our feet are busy going,
No time for idle growling when we're planting seed and sowing.

There's something to be thankful for, no matter how things go
No end to all our blessings if we only count them so,
And even if you're out of sorts, or sick, or sad, or poor,
Just thank the Lord you're living if you can do nothing more.

—*Selected*.

A Lesson on Some Whys of Crop Rotation

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

PREPARING FOR AND PLANNING THE SEASON'S CROPS

With the lengthening days our thoughts are naturally along the lines of planning for the coming season, especially in the way of making out and sending the seed order, so that there will be no delay in taking advantage of the earliest moment that seed sowing becomes possible.

Those who adopt the excellent plan of keeping a diary, and note weather temperatures, dates of sowing, germination, etc., together with results obtained, are in a better position to review the past successes and failures than is the case with those who trust to their memories alone. Frequently more can be learned from failures than from anything else, especially if we arrive at correct conclusions as to their cause.

Owners of large gardens have room enough to grow a sufficiency of everything for their requirements which their climate will produce; but with smaller areas it is frequently necessary to consider the question of what to grow and what not to grow, and to divide up a limited space to the best advantage. It is generally a wiser procedure to grow a few varieties well than to attempt a larger number than can be successfully brought to maturity upon the space given them.

In those cases where one cannot produce everything in the way of vegetables required by their household it is better to leave out those articles which deteriorate least, or do not deteriorate at all when sent to the market. For instance, there is not as a rule a great deal of difference in quality between potatoes grown at home and those obtained from the market; whereas under no possible conditions can we buy peas and beans at all approaching the quality of those we can grow for ourselves, and it would therefore be better to secure a constant supply of these latter than to grow potatoes unless we have room enough to produce a sufficiency of all.

It is well at this season to map out upon paper a general cropping scheme so as to see what amount of space can be devoted to each kind, both in relation to the second, as well as to the first crop we propose to plant, bearing in mind the fact that, generally speaking, two crops in a season may be obtained off the same ground, of course leaving out of consideration permanent crops like asparagus; and even if conditions do not always permit of averaging two crops in a year, we can certainly average three crops in two years off the entire ground not devoted to things which are permanent.

In making plans, whether in our minds or upon paper, it is worth while to consider the question of rotating the various crops, so that a given species does not occupy the same ground in successive years and that an interval of one or more years shall pass before it is grown there again.

AN UNDERLYING PRINCIPLE OF CROP ROTATION

One underlying principle of crop rotation is the conservation of soil fertility, and it is, in a general way, more strictly adhered to in connection with farming than with gardening; in fact, very frequently farm leases contain clauses stating that certain crops shall not be grown upon the same ground except after certain specified intervals.

A rotation is the arranging of a succession of crops which will tax the soil for plant food in a different manner. Some plants require certain elements of plant food in different proportion than others, and in the case of

nitrogen some do not require it in the soil at all as they obtain it from the air. Peas and beans are among the latter and are designated nitrogen-producing crops; while corn and cabbage are among those classed as nitrogen-consuming, therefore, by growing the latter after the former the necessity of adding nitrogen is, to a great extent, if not entirely, obviated. While it may not always be possible to avoid the direct application of nitrogen to some crops in a vegetable garden, yet it is easy so to arrange a rotation of crops for a farm that it will render direct applications of nitrogen entirely unnecessary.

While our cultivated plants require food containing some of all the various elements which are found in vegetable matter, yet they do not all take up these elements in the same proportions; for instance, there is about eight times more lime in a given weight of cabbage than in the same weight of potatoes, and if we grow the same crop continually upon the same ground we gradually exhaust the soil of the requirements of that crop that are in an available condition, and, unless special fertilizers are added, the time will arrive when that particular crop will cease to produce anything worth while; and in this connection we must remember that no excess of one element will compensate for a deficiency in another, or in others. It must be emphasized that in speaking of plant food being exhausted it only applies to that which is available, as for all practical purposes no system of cropping will exhaust a soil of its mineral constituents, of which only a small amount is ever in an available state at one time; therefore by growing the same crop year after year upon the same ground the available food which that crop requires in the largest quantity is used up faster, and there is not enough of that food to supply its full requirements, and therefore the yield becomes less, but by growing another crop which requires less of what the other required the most, opportunity is given for an increase in the available amount of that ingredient.

Then again, species differ in their methods of seeking nourishment. We can have two distinct plants practically agreeing in their food requirements, yet one might fail where the other would succeed. Suppose, for instance, members of the cabbage family had been grown continuously until the soil began to fail, even then we might grow good crops of parsnips and carrots for the simple reason that they send their roots down into a stratum which the other crops never reached. It is most instructive to bear in mind that, although the parsnip will do well upon soil of which the surface has been more or less exhausted, yet the dry matter of this plant contains thirty-six per cent of potash, eleven per cent of lime, and twenty per cent of phosphate. How does the parsnip obtain its mineral food in a soil which for other crops appears to be exhausted? Simply by pushing down for it into a mine that has hitherto been but little worked, though the cabbage might fail in the same plot because the superficial stratum had been over-taxed.

As far as we have gone the subject has been considered in regard to the conserving and making the greatest use of the natural soil fertility, and these considerations have a greater bearing upon farming than upon gardening. Gardening is a more intensive branch of agriculture than farming. In gardens we adopt methods of cultivation and manuring which would be impracticable and unprofitable in connection with farming; and these

methods to a great extent enable gardeners to look upon a *strict* rotation of crops, so far as it relates to plant food, as of secondary importance, although even in this relationship it must not be ignored entirely. The farmer has to arrange his rotation to fit as far as possible the kind of crops the land is naturally best adapted to insure, in a run of seasons, the most profitable results. The mechanical condition of a soil, for instance, whether sandy or clayey, causes it to be less fitted for some crops than it is for others; and there are also other considerations outside soil which have a bearing upon a farm rotation.

CROP ROTATION IN THE GARDEN

We cannot follow the same procedure in cropping a garden. Some consideration can certainly be given to what our soil and climate will especially favor among garden crops, but, notwithstanding this, the gardener has to grow something of everything and he cannot restrict his operations to such crops as the land is particularly adapted for, but he must endeavor to render his garden capable of carrying more or less of all the vegetables and fruits that find a place in household requirements, and which it may be possible to grow in his climate. That sometimes failures occur at certain points is inevitable, nevertheless his aim will be, and must be, of a somewhat universal kind. At the same time in the case of a garden which varies in its mechanical condition, one would arrange to have potatoes, for instance, upon the lightest and most sandy portion, and cabbage and cauliflowers upon that containing the most clay.

As regards the natural mineral constituents of a soil, a gardener can to a great extent, however, afford to ignore in some ways a rotation inasmuch as he has more power to nullify untoward conditions than the farmer; by the proper use of the spade and other hand implements, he can give his garden deeper and more thorough cultivation than is either practicable or profitable by the use of farm implements. A gardener in growing a little of everything, perhaps only one row at a time of any one species, can give a particular species more of what it requires most of; for instance, a few handfuls of fine bone meal scattered along the line before sowing peas and beans will give these just the phosphate they require in a position near at hand to them. In any case the manuring of a garden should be upon a more extensive and more frequent scale than is practicable in farming, and a well-handled garden always contains considerable reserves of available plant food.

THE VALUE OF MANURING

There is a point related to manuring which is indirectly connected with our subject.

Both farmers and gardeners are aware of the great value of stable manure; it is for all practical purposes a well balanced food, although it may vary in the percentage of its constituents according to what the animals have been fed upon and as to whether they are being grown, worked, or fattened, and there is nothing so effective in the production of vegetables. It is also beneficial in adding humus, and in bettering the mechanical condition of both heavy clays and light sands. There is, however, something connected with it which cannot be explained by the combined effects of the plant food and humus it adds to, and its mechanical effect upon, the soil.

Last month we drew an analogy between the feeding of plants and the feeding of animals, and it was pointed out that in the case of the latter it is necessary that their food contain some, at present unknown, vital principles to which the term "Vitamines" has been given. It was further stated that there appears to be considerable evidence from the results of laboratory experiments and in other directions to show that some accessory substances acting in a similar way are necessary to plants, and that there

is no doubt that the greater and more lasting effect of stable manure and other animal refuse is due to the existence of this substance or substances.

It seems worth while in this connection to allude to one of the Rothamsted experiments in the field.

A plot of ground was taken to which stable manure was annually applied for twenty years, from 1852 to 1871. The effect of the stable manure continued to increase for the first thirteen years; it then increased no more but remained at its high level. In 1872 the stable manure was discontinued. Upon this plot the same crop has been grown from 1852 down to the present time, and although the yield has gradually fallen since the manure was discontinued, it is still thirty per cent higher than another plot alongside of it which has been growing the same crop all the time but has had no manure whatever, although in other respects treated similarly. This experiment proves several facts, but the only one which we need consider now is the strikingly lasting character of stable manure as well as the value of organic manure in building up a soil.

In these days stable manure is difficult, and in some localities almost impossible, to obtain, and therefore one is not always able to get sufficient to manure the entire garden each year. In this case its application should be rotated, so that the entire garden will at least get a dressing of stable manure at more or less frequent intervals. We have in a previous month pointed out that the shortage of stable manure can in some respects be made good by the use of stock-yard manures and the turning under of green crops. At any rate in planning the work of the garden the question of the rotation of manure has sometimes to be considered.

IMPORTANCE OF ROTATION TO COMBAT PESTS

Coming back to the rotation of crops, this in a vegetable garden is really more important in connection with insect and fungus pests than with anything else, and this importance is greater in respect of some crops than with others.

In these days insects and fungi of numerous species give us an increasing amount of trouble, and upon a place of any size one man can find plenty to do in devoting his whole time during the growing season to the work of spraying, etc., both for prevention and cure. In a vegetable garden a rotation can be made as regards some crops an indirect means of preventing and reducing the ravages of "pests."

While many of these economic parasites use several species of plants as hosts, yet there are certain of them which attack, so far as our gardens are concerned, only one family or species. Before, or at the beginning of, the winter season these pests go into a dormant stage and hibernate in some form or another until the following growing season. Naturally, and invariably, they pass the Winter near where they lived during the Summer, and it therefore follows that if we grow a crop upon the ground occupied by the same crop during the preceding year it will be more liable to attack by its special pests than if it occupied a position some distance away which had not grown that crop for several seasons. This is especially true in those cases where the pests live and work under the surface and attack the plants' roots.

One of these latter is a fungus known as Club-root which attacks, more or less, all members of the Cruciferous family and is especially effective in damaging cabbage and cauliflower. The fungus which produces Club-root belongs to the *Myxomycetes*, or "slime fungi," which live upon decaying vegetable matter. This fungus ramifies within the tissues of the roots of attacked plants, causing first a swelling on the roots the interior of which afterwards becomes full of slimy matter. Eventually

an amazing number of spores are produced of so small a size that millions would be required to cover a square inch. When a spore germinates, its contents escape through a small aperture in its wall and begins moving about of its own accord by means of a microscopic hair which wriggles about like the tail of a tadpole. It is one of those organisms which form a connecting link between the animal and the vegetable kingdoms. Unlike the potato disease, or at least the oldest and most prevalent one of the several diseases affecting this tuber, which spreads from plant to plant through the atmosphere, the fungus causing club-root remains in the soil at all its stages and can only spread through that medium. Nothing can be done to control this or any other pests affecting roots by spraying, which renders it the more imperative to rotate crops of this kind.

While it has not come into my own personal experience, cases have been heard of where an entire garden has become infected with club-root. It is to a great extent preventable by heavy dressings of quick-lime worked into the surface of the ground some time before setting out the plants; and in any case cabbage and cauliflowers require more lime as actual food than any other crops. It is possible to bring this disease in by purchased plants, and plants with any swellings upon their roots should be discarded and burnt, whether purchased or grown one's self. Sometimes a swelling upon the roots, similar in outward appearance, is caused by an insect. While this is not so harmful as the fungus, it always has the effect of checking growth. In the latter case a legless maggot will be found inside the swelling, while the interior of the enlargement caused by club-root will be more or less decayed. In the latter, insects will, after a time, find their way into this, but they are only a secondary feature of the trouble. As an additional preventative the stumps and roots should always be burned.

While the potato disease which is the principal cause of potatoes rotting, attacks the tops first, and can be prevented by frequent spraying, it is advisable to have the interval between growing this crop upon the same ground as long as possible.

There are undoubtedly several species of fungi which cause potato tubers to rot and some of these may infect the tuber in the soil without appearing upon the haulm, and certainly the newer wart disease is a soil fungus. These are additional reasons for not planting potatoes more often upon the same ground than is absolutely necessary. With these also, and with all other diseased vegetable matter, burning the haulm and other remains is advisable; if burning is impracticable, then a hole can be made in which the refuse may be placed and thoroughly mixed with quick-lime.

SOME CROPS THAT CAN BE ALTERNATED ANNUALLY

While for the reasons stated it should be considered imperative to strictly rotate the Cabbage family, in which turnips may be included, potatoes, and other things which are liable to diseases attacking their roots; and while it is better to rotate other vegetables as much as possible, still more or less elasticity may be introduced into the rotation, so far as pests are concerned, of those things whose troubles come from those which only attack the parts of the plants which are above ground, so as to fit the rotation to other considerations.

For instance, one may have a plot in their garden which is exceptionally suited for early work by reason of its being sheltered by a well, building, etc., and so placed that it gets full sun. In this situation the frost will be out of the ground sooner than elsewhere, and it will therefore give opportunities for early sowing and for securing a crop a week or two earlier than would be the case in other parts of the garden. As peas and

spinach are always the first things to be sown and to be gathered from the open ground, there is no reason why a border of this kind should not be devoted to these every year without the crops deteriorating at all, provided the ground is kept rich, sweet and light, and at the same time otherwise handling along the lines previously mentioned in these columns. If the border is large enough to carry the first crops of both peas and spinach, the portion upon which one is grown this year could be devoted to the other next year, in this way a nitrogen-producing, could alternate with a nitrogen-consuming crop. This latter point should have consideration in cropping the entire garden so that as far as possible crops which obtain their nitrogen from the air, like peas and beans, should alternate with those like corn, cabbage, etc., which require a sufficiency of nitrogen to be present in the soil.

Apart from the above necessity of allowing at least a few years interval if possible between some crops, a certain amount of rotation is easily obtained in the ordinary course of things. As the earliest crops mature they are succeeded by others, and these are followed in the autumn by a cover crop for turning under just before Winter. So that along these lines the entire garden which is under annual cropping gets a certain amount of change in species, thereby avoiding waste of, while at the same time conserving, plant food.

ROSE COLUMBIA

THE Executive Committee of the American Rose Society at a recent meeting voted to award to the hybrid tea rose Columbia, registered in 1917 by E. G. Hill of Richmond, Indiana, the Gertrude M. Hubbard gold medal for the best rose of American origin introduced during the last five years.

This reward was made possible by the generosity of Mrs. Gertrude M. Hubbard of Twin Oaks, Washington, D. C., and has been awarded but once when, in 1914, it was given to M. H. Walsh of Woods Hole, Massachusetts, for the introduction of the climbing rose Excelsa.

The honor which goes to Mr. Hill is distinctive. It is the highest honor which the American Rose Society can confer on a hybridizer, and it is a recognition, not only of a variety of merit but of the valued work of a pioneer in rose breeding—one who has devoted half a century of real service in the advancement of the rose, through breeding a type admirably suited for American conditions.—E. A. WHITE, Secretary.

The rose, Columbia, is proving to be a decided favorite and is now regarded as one of the finest out-door, pink roses ever introduced. Strong, sturdy in growth with handsome foliage, flowers of a glowing pink color.

DECAY OF PUBLIC PARKS

THE broad fact in connection with the decay of public parks which may be seen in nearly all our American cities is that we Americans are better at starting things than we are at taking care of them afterwards. We employ our Olmstedes and our Vaux to create beautiful parks, and then leave them to the tender mercies of men without education in the profound art and science of the making and care of pleasure grounds. There is no art or science which demands a deeper or broader education than this. And the difference between expert knowledge and utter neglect in such a matter can be noted fully in a single day by comparing the appearance of the Arnold Arboretum with that of Central Park in New York or Franklin Park in Boston.—*Boston Transcript*.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

L. P. JENSEN, *President*, St. Louis, Mo.

D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.

M. C. EBEL, *Secretary*, Madison, N. J.

Trustees for 1920

Peter Duff, Orange, N. J.; William Waite, Rumson, N. J.; Arthur Smith, Elberon, N. J.; Robert Weeks, Cleveland, O.; William H. Griffiths, Detroit, Mich.

Directors

(To serve until 1921)—William N. Craig, Brookline, Mass.; William Heitreck, San Gabriel, Cal.; William Gray, Newport, R. I.; C. H. Hensen, Great Falls, Mont.; Thomas Hatton, New London, Conn.; Albin Martini, Lake Geneva, Wis.; A. C. Jordahn, Palm Beach, Fla. (To serve until 1922)—George Wilson, Lake Forest, Ill.; James Stuart, Mamaroneck, N. Y.; William Kleinheinz, Ogontz, Pa.; John F. Huss, Hartford, Conn.; Edwin Jenkins, Lenox, Mass.; Carl N. Fohn, Colorado Springs, Colo.; Joseph Tansey, Tuxedo Park, N. Y. (To serve until 1923); Robert Williamson, Greenwich, Conn.; Robert Cameron, Ipswich, Mass.; Theodore Wirth, Minneapolis, Minn.; George H. Pring, St. Louis, Mo.; George W. Hess, Washington, D. C.; Daniel J. Coughlin, Locust Valley, L. I.; John Barnet, Sewickley, Pa.

PRESIDENT'S APPOINTMENTS

Owing to an over-sight which occurred in the secretary's office the name of Robert Williamson, Greenwich, Conn., was omitted from the list of directors appointed by President Jensen to serve for three years until 1923.

AN EXECUTIVE MEETING CALLED

President L. P. Jensen has called an executive meeting of the trustees and directors of the association to meet in New York during the week of the New York Spring Flower Show, beginning March 14. Members of the executive committee will be duly notified when plans for the meeting are completed.

GARDENERS' CONFERENCE IN NEW YORK

During the Spring Flower Show week in New York, a gardeners' conference will be held under the auspices of the national association. The program will consist of a general discussion of the work the association is undertaking, and on the operation of the Service Bureau, in which all members and those interested in the profession of gardening are invited to participate. Announcement of the meeting place and date will be published in the horticultural press later.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received for the Service Bureau Publicity Fund to January 30:

Previously acknowledged	\$541.00
Thomas J. Kennelly, Locust Valley, L. I.	5.00
William Graham, Greenwich, Conn.	5.00
Alfred Lunden, Reading, Pa., for five years	25.00
Thomas L. Hughes, Convent, N. J.	5.00
John Mackintosh, Syosset, L. I.	5.00
W. G. Woodger, Great Neck, L. I.	5.00
Jack Baxter, Lake Forest, Ill., yearly	10.00
John McCoy, Cold Spring Harbor, L. I.	3.00
Frank W. Evenden, Fairfield, Conn.	2.00
John V. Borin, Centre Moriches, L. I.	2.00
Robert Glen, Port Chester, N. Y.	5.00
T. J. Kempton, Baychester, L. I.	3.00
James Marlborough, Topsfield, Mass.	2.00
John S. Doig, Barrington, R. I.	3.00
Adam Mann, Tyringham, Mass.	2.00
W. R. Fowkes, Cooperstown, N. Y.	5.00
Edward Batchelor, Akron, O.	2.00
Thomas W. Stobo, Garrison, N. Y.	5.00
George Bell, Sterlington, N. Y.	5.00
Peter Macdonald, Sabattis, N. Y.	5.00
Henry Stewart, Waltham, Mass.	2.00
Jacob Vatter, Nashotah, Wis.	1.00
William MacKey, Newport, R. I.	5.00
George Hewitt, Lenox, Mass.	2.00
Anton Bauer, Bradley Beach, N. J.	10.00
Joseph Goatley, Port Chester, N. Y.	5.00
John R. Ness, Waverly, Mass.	5.00
Samuel Golding, Morristown, N. J.	2.00
Herbert Woodger, Oyster Bay, L. I.	2.00
Alfred Woodger, Oyster Bay, L. I.	2.00
W. B. Jackson, Summit, N. J.	2.00
Andrew Crombie, Mt. Kisco, N. Y.	5.00
Manns Curran, Sewickley, Pa.	5.00
William Lund, Cazenovia, N. Y.	2.00
J. W. Davidson, Bernardsville, N. J.	5.00
Ernest Riddell, Brookline, Mass.	2.00

David F. Roy, Marion, Mass.	2.00
Bruce Butterton, Newport, R. I.	3.00
James Allan, Truro, N. S.	3.00
Edgar Osborne, Williamstown, Mass.	2.00
F. H. Butler, Lenox, Mass.	2.00
Jesse H. Frampton, Glen Cove, L. I.	2.00
Andrew Kneucker, Shrewsbury, Mass.	2.00
Walter J. Dack, Shrewsbury, Mass.	3.00
Hugo P. Stenstrom, Hartsdale, N. Y.	3.00
John Henderson, Mamaroneck, N. Y.	2.00
J. A. Weber, Excelsior, Minn.	2.00
James C. Berry, Paris, Ky.	5.00
A. C. Jordahn, Palm Beach, Fla.	2.00
Stephen Bernath, Midland Park, N. J.	2.00
Olaf Blomberg, Granville, O.	15.00
W. N. Craig, Brookline, Mass.	10.00

Total\$765.00

The contributions so far received are not sufficient to carry on the work of the Service Bureau as outlined at the convention in Cleveland, and as published in detail in the report of the proceedings sent to members. The estimate of the cost to test out the merits of the Service Bureau and its benefits to the association and the profession, was a conservative one. At the present time over eighty dollars a month is being expended for advertising alone, but those at all familiar with advertising cost, will realize that the expenditure of such an amount for advertising is a very meager one, though it is bringing in good results. Those members interested in the development of the Service Bureau, who have not yet contributed to the publicity fund, should send in their contributions without delay, that the committee may know what funds it can rely on, and complete its plans.

THE SECRETARY'S CORRESPONDENCE

Owing to an unusually large amount of mail which has reached the secretary's office during the last two months, besides the other activities of the association, the secretary has not been able to give the communications the prompt attention he would like to give them, and must ask therefore the indulgence of members, whose letters have been delayed in being answered.

COMMITTEE ON SCHOOL GARDENS

BOARD OF EDUCATION

Division of Educational Extension

Cleveland, January 23, 1920.

Mr. G. H. Pring, Chairman Committee on School Gardens,
The National Association of Gardeners,
St. Louis, Mo.

I wish to thank you for yours of September 25, which I regret has been unanswered to now for various reasons.

Personally I wish to say that the report of the Committee on School Gardens appointed by the National Association of Gardeners was very timely and of considerable assistance in the Fall when we revised our course of study. I wish to say for your information that the science department here passed resolutions approving your recommendations without change.

The Cleveland Board of Education is very grateful to the committee and to the National Association of Gardeners for their suggestions and help in making the course of study more practical.

O. M. Eastman,
Supervisor of Gardens.

The foregoing communication is the acknowledgement of a report submitted by the School Garden Committee appointed at the Cleveland convention, consisting of G. H. Pring, Missouri, Arthur Smith, New Jersey, M. C. Ebel, New York, at the request of Mr. Eastman, supervisor of the School Gardens of Cleveland, who appeared before the convention to invite the co-operation of the gardeners' association in the school garden work and to secure suggestions for the development of the school garden movement of that city. Mr. Eastman stated that up to 1918 not more than \$500 a year had been expended by the Cleveland schools for promoting school garden work, but that for 1920 an appropriation had been provided of over \$23,000.

SUSTAINING MEMBERS

Harry B. Clow, Lake Forest, Ill. (James Wilson, superintendent), General Richard Coulter, Greensburg, Pa. (N. T. Forsyth, gardener), H. L. Thompson, Toledo, O. (H. H. Hundt, superintendent), have become sustaining members of the association.

NEW MEMBERS

The following names have recently been added to our membership list: James C. Tough, Rye, N. Y.; Fred Stratford, Yonkers, N. Y.; Herman Schafer, Riverdale, N. Y.; James Lyon, Marion, Mass.; Herbert B. Lord, Louisville, Ky.; D. Miller, C. A. Muehldorfer, Paul A. Kohl, St. Louis, Mo.; Charles Biggers, Roslyn, L. I.; William La Bella, Port Chester, N. Y.; Severin Haugland, Hibbing, Minn.; John Shaw, Cold Spring Harbor, L. I.; William Fremd, Jr., Gerard C. Boon, Greenwich, Conn.; John L. Mearns, Bryn Mawr, Pa.; Jerome B. Murphy, Elberon, N. J.; William S. Butler, Glen Cove, L. I.; Thomas A. Clark, Port Washington, L. I.; Charles A. Brazier, Syosset, L. I.; Robert Davidson, Port Washington, L. I.; Stanley Ballance, John H. Marx, Oyster Bay, L. I.

AMONG THE GARDENERS

William Tart of Tivoli, N. Y., has accepted a position of superintendent of the H. S. White estate, Bedford Hills, N. Y.

Jack Baxter, for the past several years in charge of the greenhouse range of Melody Farm, Lake Forest, Ill., has secured the position of gardener on the Charles H. Thorne estate, Lake Forest.

A. V. Macdonald for many years the superintendent of Duke's Park, Somerville, N. J., has entered the commercial field. He has established a retail store in Somerville, and has purchased a farm on the outskirts of that city where he intends to erect a greenhouse range.

John Turnbull, for the past nine years gardener at Hollin Hall, Alexandria, Va., mond, "West Holme," Santa Barbara, Cal., and Akron, Ohio, recently entered the commercial field, engaging in the flower growing business in Santa Barbara.

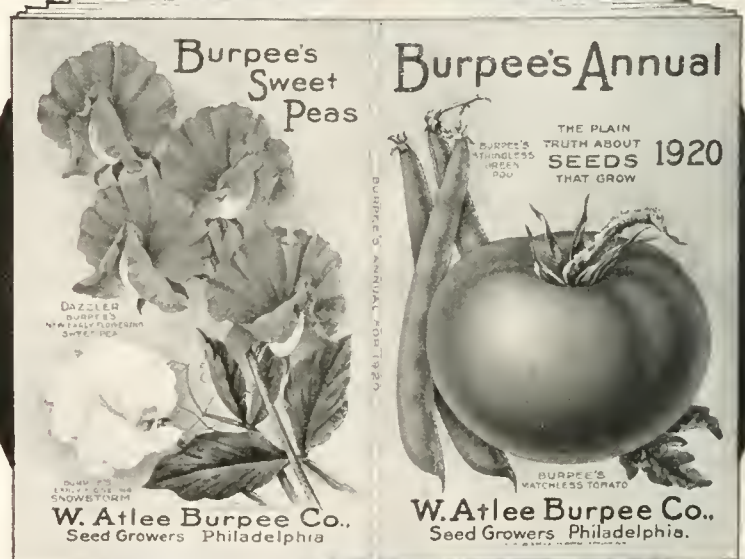
George Hutton, formerly of San Mateo, Cal., has accepted the position of gardener of "West Holme," Santa Barbara, succeeding Mr. Turnbull.

Peter Boury has accepted the position of gardener at Hollin Hall, Alexandria, Va.

Robert Whan, formerly of West Neck Farm, Huntington, N. Y., has secured the position of gardener on the J. H. Burton estate, Cedarhurst, N. Y.

Robert Melrose, formerly superintendent of the H. H. Rogers estate, Southampton,

Burpee's Seeds Grow



BURPEE'S ANNUAL FOR 1920

The Leading American Seed Catalogue

Burpee's Annual is a complete guide to the Vegetable and Flower garden. It fully describes the Burpee-Quality seeds with a hundred of the finest vegetables and flowers illustrated in the colors of nature. If you are interested in gardening Burpee's Annual will be mailed to you free.

Write for your copy today.

W. ATLEE BURPEE CO.
Seed Growers Philadelphia

N. Y., has accepted a similar position on the Geo. M. Sidenberg estate, Mt. Kisco, N. Y.

Lewis Barnet has secured the position of superintendent of the R. B. Mellon estate, Pittsburgh, Pa.

William Allen, formerly of the Burton estate, Cedarhurst, L. I., has accepted the position of superintendent of the F. C. Littleton estate, Mamaroneck, N. Y.

Thomas Hambleton has accepted the position of gardener on the B. H. Howell estate, Suffern, N. Y.

In Memory of

Mrs. Mary B. MacMachan

The atheist scoffs at Heaven,
The learned no hell conceive;
God says that both existeth,
And we know whom to believe.
The book that built this Nation,
Is good enough today,
Let them preach their isms glibly,
The Bible's here to stay.

We thought of this, as we watched o'er
The dust of her who is gone,
That Time gives up our records
When God deems our tasks are done.
That the soul of her, we loved so,
Through space has winged its way,
To the mansions God's prepared
Ere He formed us from the clay

That cheerful voice, alas! no more,
Her disposition kind;
Her time and toil, for the Red Cross,
Tuxedo 'll bear in mind,
Those kindly deeds will long survive
The grave wherein she's laid;
The zeal and force of character,
From memory shall not fade.

DAVID S. MILLER.

It is with deep sorrow that we record the death on January 20, of Mrs. Mary B. MacMachan of Tuxedo Park, N. Y., widow of James B. MacMachan, for many years the superintendent of "Imslagh," the country estate of George F. Baker, located at Tuxedo Park, N. Y., to which position Mrs. MacMachan succeeded her husband on his death. Mrs. MacMachan was the only woman member of the national association, holding active membership by virtue of her position. She was presented with the association's medal last year as the winner of the greatest number of points in the competition at the monthly meetings of the local society during the year 1918. Mrs. MacMachan took keen interest in the affairs of the association, attending the Cleveland convention held in August last, and those who had the privilege of meeting her, will always remember her pleasing personality. She is survived by her two daughters.

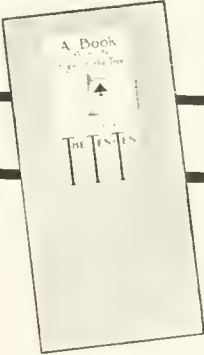
THE AMERICAN IRIS SOCIETY

This new flower society was organized at The New York Botanical Garden, on January 29, 1920, with a broad policy covering every phase of iris interest. It will create a central bureau for the collection and dissemination of authoritative information on the culture and treatment of the plants, the choice of named varieties, and the possibilities of the use of iris for cut-flowers, or garden and massed planting. Iris are generally considered a plant for the amateur and somewhat beneath the notice of a professional gardener but certain species vie with the orchid in both splendor of color and difficulty of treatment, while few realize the opportunities of using them in landscape to create sheets of unusual coloring. Recently there has been a flood of new intro-

ductions, many showing new hues and surpassing the old familiar varieties in size and height. To judge these fairly, rectify the nomenclature, and put this information within reach of even the grower of a few irises is of prime importance. Few flowers will do more to make a successful display in the garden throughout the spring and early summer. The society hopes to co-operate with existing associations of kindred interests in every way, but it will be in the developing of many small exhibitions in different parts of the country rather than in promoting one large annual show. Iris flowers are not adapted to transportation and only in the local shows can they be

shown in perfection, and there we can develop a pleasant rivalry. We hope to see many such shows this coming spring; but initial action should come from the already established organization.

The following officers were elected to serve until the annual meeting in the spring. J. C. Wister, Pres.; Wm. A. Peterson, Vice-Pres.; Frank H. Presby, Treas.; R. S. Sturtevant, Sec. Wellesly Farms, 95; Mass.; Regional Vice-Presidents are: S. B. Mitchell of California, Dr. F. E. Bennett of Ontario, T. A. Kenning of Minneapolis, Mrs. Samuel H. Taft of Cincinnati, B. Y. Morrison of Washington, D. C., Floyd Brallior of Nashville, Dr. H. A. Gleason,



The Ten-Ten Catalog Was Made For You

Suppose, just for instance, you want Snapdragon seed, and you want it quick.

Suppose you turn to your catalogues and find listings of them as long as your arm and every one claims to be just as good as every other one. Suppose you just didn't happen to know as much about Snaps as you do. How are you going to make selections, without spending a whole evening studying catalogues?

Now suppose you have a catalogue that listed only Ten. Ten of the ones that the experts say are the topnotchers. Ten with just enough descriptions to tell you exactly what you want to know and no more. No long winded, sugar-coated stuff, but facts.

You would go down to meet such a catalogue with a brass band, now, wouldn't you?

Well, that's just the kind of a catalogue The Ten-Ten is. Everything grouped in tens.

Send for it. Never mind about the band this time.

Julius Roehrs

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At The Sign of The Tree
Box 20 Rutherford N.J.

B. H. Farr, Edwin C. Shaw, and Harry A. Norton.

An unanimous vote of thanks was tendered Dr. N. L. Britton, Director of The New York Botanical Garden, for the hearty support given the new society through Dr. H. A. Gleason and the cordial hospitality which made the meeting a pleasure as well as a success. R. S. STURTEVANT, Sec.

LOCAL SOCIETIES

SEWICKLEY (PA.) HORT. SOCIETY

The regular monthly meeting was held on January 13. Walter E. Cook, of Cleveland, and Walter J. Barnwell, of New York, were visitors. Mr. Cook installed the officers for 1920 as follows: For President, Wm. Thompson, Jr.; for vice-president, John Carman; for treasurer, W. W. Scott (re-elected); for secretary, John Barnett, the latter accepting the office only until a permanent secretary can be elected. John Carman was awarded the N. A. G. silver medal for most points gained at monthly meetings during 1919. Votes of thanks were tendered retiring officers, and the Executive Committee instructed to draw up schedule for 1920.

JOHN BARNETT, Sec. Pro Tem.

NASSAU COUNTY (N. Y.) HORT. SOCIETY

The monthly meeting was held January 14. President Thos. Twigg occupied the chair. John McGregor, Maurice Fuld, Thos. Proctor, Norman Bruce and J. M. Brown were elected active members, and ten petitions for active membership were received. It was decided to hold a dinner and President Twigg appointed E. J. Brown, Jack Everett and Ernest Westlake a committee to make arrangements. Harry Goodhand was elected trustee for two years to fill the vacancy caused by the resignation of Robert Jones. Messrs. Young, Manda, Sperling, Popp and MacGregor were visitors at the meeting.

ARTHUR S. COOK, Cor. Sec.

NORTH SHORE (ILL.) HORT. SOCIETY

The regular monthly meeting of the North Shore (Ill.) Horticultural Society was held January 2. Severe weather caused a poor attendance, and as some of the new officers for 1920 were absent it was voted to install them at our February meeting. It was decided to hold a smoking concert in February. Messrs. Head, Kuehne and Benson were selected to look after the entertainment. President Bollinger is preparing a program to have a paper of interest read at each meeting. An interesting letter from our late president, Wm. Fischer, now in Boston, describing the evergreens in the Arnold Arboretum was read. The membership of the society increased 60 per cent during 1919.

J. R. CLARKE, Cor. Sec.

NORTH SHORE (MASS.) HORT. SOCIETY, INC.

Nineteen-twenty finds this society in good financial condition, with prospects for a prosperous year, the treasurer and secretary's report showing an increase in funds and membership. Frank P. Knight was re-elected president, and Leon W. Carter, secretary.



THERE isn't any doubt that the little lady is pleased with the roses that John has cut especially for her, nor that John is pleased with the Greenhouse that grew them.

He says he never saw a better Greenhouse, and he doesn't have to worry about the temperature, even on the coldest nights. That's only one of the good points about the V-Bar Greenhouse.

Stop in and talk it over

WILLIAM H. LUTTON
COMPANY, INC.  512 FIFTH AVENUE
NEW YORK CITY

Other officers elected were A. E. Parsons, vice-president; Frank Foster, treasurer, and Myrie C. Horton, librarian. Board of Directors, Herbert Shaw, Fred J. Merrill, Axel Magnuson, Walter G. Ritchie and H. W. Purington. A short time ago an organization was formed for the purpose of trying to save the woodland on this section of the North Shore, this society being sponsors for the new organization, which is known as the North Shore Forestry Protective Association. Allan S. Peabody is chairman, and A. E. Parsons, secretary, the association being made up of representative men and women from every town and district on the North Shore.

At a recent meeting of the N. S. H. S. it was voted to give this association the free use of Horticultural Hall and to assist them in every possible way in their campaign to save the woods in this section from the lumberman. It was also voted to tender the Garden Club of America the use of the hall when it holds its conventions here.

WM. TH.

MONMOUTH CO. (N. J.) HORT. SOCIETY.

The regular monthly meeting of the Monmouth Co. Hort. Society was held in Rumson, N. J., January 8, with a good attendance. The new officers were on hand to guide the progress for 1920. The feeling is that progress is apparent and once again our motto will be onward for the advancement of horticulture and floriculture, particularly so in the vicinity of Rumson. A public park of about five acres is to be laid out and also a public library. There will be four exhibitions during 1920: 1st, Exhibits of Iris, bulbs, etc.; 2nd, Sweet Peas, Strawberries, etc.; 3rd, a large exhibition toward the end of September which would constitute our principal show, with prize money, while the three other exhibitions are for honor only; the fourth exhibit would bring out the 'Mum exhibits or anything worthy of notice. The officers are as follows: W. H. Waite, president; P. E. Hicks, first vice-president; Heatherington,

second vice-president and Geo. Masson, third vice-president; H. A. Kettel, secretary; W. Dowlen, financial secretary; Wm. Mitzdorff, treasurer. W. T.

WESTCHESTER (N. Y.) AND FAIRFIELD (CONN.) HORT. SOCIETY

At the regular monthly meeting of the society the following officers were installed: President, John Andrews; vice-president, Harry Jones; treasurer, James Stuart; financial secretary, Oscar Addor, Larchmont, N. Y.; corresponding secretary, John Conroy, Greenwich, Conn.; Executive Committee: W. J. Sealey, Joe Stobo, Alex Clarkson, W. Whitton and Alex Smith. Meetings to be held in Hubbard's Hall, Greenwich, Conn., on the second Friday of each month. The treasurer's report for the past year showed the funds of the Society are well invested. The secretary reported that 25 members were enrolled in the past year. Ten are on the suspension list and one was scored from the books for non-payment of dues. Arrangements were made to hold an entertainment in the near future. JACK CONROY, Cor. Sec'y.

LENOX (MASS.) HORT. SOCIETY

The regular meeting was held January 14 with a record attendance, some of the members having come from New York City to be present at the installation of officers. The newly elected president, Oliver Lines, occupied the chair. It was voted to hold the regular shows in 1920. Some interesting discussions were heard on the most practical bulbs for greenhouses, also an interesting discussion on roses.

A literary committee was appointed, the president emphasizing the importance of a program for each meeting for 1920.

FREDERICK KIRKHAM, Rec. Sec.

TUXEDO (N. Y.) HORT. SOCIETY.

The annual meeting was held on January 7. The following were elected as officers for the current year: President, Edward Wilson; vice-president, Wm. Muir; treasurer, Charles Davidson; secretary, James Davidson.

The treasurer's report showed the society to be in a flourishing condition. The secretary's report was equally satisfactory. A hearty vote of thanks was given to the retiring officers. The following were elected to serve on the executive committee: D. MacGregor, E. Barth, J. Tansey, D. MacIntosh, Thos. Lyons.

JAMES DAVIDSON, Sec.

OF GENERAL INTEREST

INTERNATIONAL FLOWER SHOW

The Seventh International Flower Show, to be held in the Grand Central Palace, New York, March 15 to 21 next, seems likely to outdo its predecessors in magnitude and scope. The final schedule of premiums has been issued, and embraces some very important features. Classes which may appeal to private growers are the specials covering the collections of flowering bulbs and bulbous rooted plants. There are three classes for table decorations in the private growers' section, and substantial prizes are offered for a basket of flowers. The class covering a group of flowering and foliage plants, with ferns, palms and bulbs permitted, arranged for effect, is this year to cover 200 square feet, instead of 100 square feet, as formerly, and the prizes are advanced to \$150 and \$100. There are some important additions to the gen-



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Announcement

We beg to announce a consolidation, effective January 10, 1920, of Carter's Tested Seeds, Inc., of Boston, Mass., and Toronto, Ontario—the branches of James Carter and Company of London, England, and Messrs. Peterson, Sinclair & Miller, Inc., of New York, who have been acting as sales agents for Carter's products in America.

The headquarters of the enlarged company will be located in New York, and branch offices established in Boston, Chicago, Philadelphia, Toronto and probably other cities.

Fully appreciating the demand for our products in the past and recognizing the added responsibility that an ever growing business must bring with it, we have built our organization accordingly, and can assure our patrons of efficient and satisfactory service.

We will continue to handle a complete line of Carter's Tested Flower and Vegetable Seeds, which for a century have been renowned for their very high quality and pedigree. A special department for this branch of the business will be maintained at Boston.

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eral classes which will appeal to private growers. In the open classes there is one for a display of bulbs, etc., as a bulb garden, three prizes, amounting to \$1,000, and the usual class covering a display of rose plants arranged as a garden, the three prizes offered amounting to \$1,000. Gardeners who have not received a copy of the schedule should write to John Young, secretary, 1170 Broadway, New York.

HORTICULTURAL EXHIBITIONS

Under the title, "Horticultural Exhibitions and Garden Competitions," the United States Department of Agriculture has issued Department Circular 62, with 38 pages and numerous illustrations. It calls atten-

tion to the fact that the spirit of competition in an organized way, will do much for the community in helping to create added interest in vegetable, fruit and flower growing, and in holding such exhibitions a large number of small exhibits should be the aim, rather than a few large displays. Under horticultural exhibits, the circular treats of organization, competitors, classification and schedules, the last named covering spring and fall shows, and exhibitions of vegetables, autumn fruits, narcissi, irises, peonies, roses, sweet peas, gladioli, dahlias and chrysanthemums, sweepstakes prizes, arrangement of exhibits, judging premiums, rules, etc. Several pages are also devoted to lawn and garden competitions, with rules for the judging and arrangement of classes

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

In transplanting the following roses: *Rosa Spinosissima*, *Tausendschön* and *Crimson Rambler*, also *Rosa Rugosa*, which roses have been 3½ years in their present location, but must be moved in the spring, how much should I cut them back? When is the best time to plant the seeds of the Blackberry Lily?—Mrs. O. G., N. Y.

Rosa Spinosissima, the Scotch rose, is a bushy rose and should be pruned rather severely at the time it is lifted, cutting out all the old and worn-out wood, at the same time shortening the new or last year's growth to six joints. *Tausendschön* and *Crimson Rambler* are of the well-known Rambler type, and in their case we would advise sacrificing the season's flowers. All two-year wood and older should be cut away entirely; the last year's growth shortened to two feet.

Rosa Rugosa, the well-known old-fashioned dog rose, should be treated much the same as *Rosa Spinosissima*, cutting away the old and worn-out wood and reducing the new.

It is necessary to reduce the top of plants to correspond with the root reduction which takes place when plants are lifted or transplanted. We always do our best to try and get as much root as possible, but no matter how careful we are we find we do not get more than one-third of the plant's roots, and for that reason we always reduce the tops or branches.

The Blackberry Lily, or Leopard Flower, botanically known as *Gemningia chinensis*, can be propagated either by division of the roots or by sowing the seeds. In the latter case the seeds are gathered when ripe and sown in a cold frame, sometime in May. They soon germinate, and should then be transplanted to rows, preferably in the cold frames—with the sash removed—planting the seedlings 6 inches apart. By fall they should be nicely developed plants, and either then or early spring may be shifted to their permanent position.—T. H.

What causes pithy or hollow celery? I have had it for the past two years, and the only thing I can put it down for is some disease which attacks it, as it seems to start from the root and work up through the stems as they gain maturity, beginning in them when quite young and by the time they are blanched, it is quite in evidence, and has a very nasty flavor when eaten. The celery always seems healthy, and no signs of any trouble on the leaves at all, only that it is pithy. I have four varieties: White Plume, Easy Blanching, Winter Queen and Winter King. The four varieties have a touch of it, more or less. Last year I lost quite a good lot of it the same way. I wrote to the Agricultural School at Farmingdale last fall, but they could not tell me anything much about it. Here is what they say: "Pithy celery appears to be a result of a malfunctioning of the cells of the plant. Just what causes this is not known, although the following facts have been noted: Celery appears to become pithy when, through any reason, growth has been retarded or slow." Also they go on to say about using plenty of manure or quick-acting fertilizer, containing nitrate of soda; also, about some



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varieties being more susceptible to it than others.

W. J. W., N. Y.

Our experience with celery is that some of the chief causes of pithiness is too early planting, lack of moisture and a too luxuriant growth. We have not noted that the celery growers for market are troubled with pithiness, and it is their practice to put out the young plants in the field around the 1st of July. Of course, the celery fields are in rather low ground, and the plants never suffer from the lack of moisture; in fact, the lowest parts of the truck farms we have in mind in early spring are often submerged, and are used year after year for celery, which fact makes it appear that moisture is one of the chief essentials for good celery growing. It is our observation that the growers mentioned above do not manure very heavy. At least, not one-quarter as much as is the general practice among private gardeners. For that reason the celery does not attain the size that one often sees at the vegetable exhibitions. But it does grow to a good table size, is much more handy to store for the winter, and is seldom or, perhaps, never pithy; besides, what is the use of big celery, anyway? Only the heart is used.—T. H.

Will you please answer the following question through the Chronicle. How can I make my Hardy Phlox bloom two weeks later than their regular season?
F. W. H., Pa.

In answer to above question as to how to retard the flowering season of hardy Phlox for two weeks, if you would pinch the growth when about a foot high, it would have the desired effect. It has been our practice to pinch about one-half the shoots, or leads, in a clump, the average 3-year-old clump having about 1 dozen leads when about one foot high, and the pinch leads flower about two to three weeks later than the unpinched ones. By removing the dead flower heads before the seeds form we thus get three and four crops of flowers from our phloxes in the season.—J. P.

Here and There

Why We Mulch Plants in Winter

Many persons if asked this question would reply: "To feed the plants and to keep them cozy and warm during the Winter."

The most you can say for this answer is that it contains some truth. We surely do not imagine that a four- to six-inch mulch of manure or leaves will prevent the penetration of such freezings as is usual in this latitude. As a matter of fact, mulching should not be done until after the ground is well frozen. To do so beforehand often means the harboring of mice and vermin in the material around the plant.

Now, as to feeding the plants, it must be admitted that the mulch, if it has manurial value, does do this but not in Winter. People don't do much feeding while asleep, neither do plants. It is only when plants are most active in growth that they assimilate the greater quantity of food. What plant food there is in the mulch is either held in suspension in the moisture of the soil or is available humus to be dug into the ground when Spring arrives. So the mulching material feeds the plant ultimately.

The prime object and purpose for mulching is to conserve moisture around the roots and to maintain a more even temperature of the soil in which the plant is growing.

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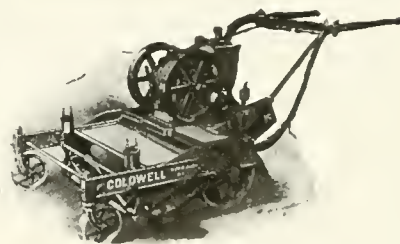
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If a plant is subjected to alternate thawing and freezing it fares worse than if the soil had remained frozen the whole Winter through. Take herbaceous perennials as an example, especially those which are surface rooting like the hardy Chrysanthemum, and note what damage is done them. By reason of this fluctuation of

temperature they are lifted entirely out of the soil and by exposure of the roots to the air and sun are often killed. A mulching of light litter prevents this from occurring by keeping the plant shaded and the soil from thawing quickly.

Without doubt the most perfect mulch and one that fulfills a two-fold purpose is

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Nature's own "snow." For this reason the Alpines of Switzerland are beautiful in the Spring after being so snugly covered with a blanket of snow and, in like manner, our own hardy perennials here are much better and stronger after a Winter in which the snow had constantly covered them until Spring had come.

How foolishly mulching is sometimes done; the material being banked up around the stem of the plant instead of extending as far as the spread of the roots. Trees of a good size, when planted in the Fall, are greatly helped by mounding the soil up around the stem in addition to the usual mulch of manure. This mounding serves to keep the tree from swaying and also prevents deep freezing.

All newly transplanted stock, whether trees, shrubs, evergreens or perennials are benefited by a good liberal mulch, using the lightest material to cover such of the latter as have esculent roots and stems.—*Florists' Exchange*.

RENAMING GERMAN IRISES.

Certain ill-advised Americans, endeavoring to demonstrate their patriotism, are out with the suggestion that the German irises should be renamed. It may be recalled that during the war these same sentimental patriots wanted to call German measles, "liberty measles," apparently unwilling that even disagreeable things should bear German names. Overlooking for a moment, the warped psychology in the case of the measles, we may point out that the reason certain irises are called German irises is because they are derived from a species of Central Europe named *Iris Germanica*. This species was long ago named according to scientific usage which does not recognize sentiment as an excuse for changing names. We may call the flowers liberty irises if we choose, but the species will continue to be *Iris Germanica*. The popular appellations of plants may be changed at will, and doubtless many of the decorative plants with German names will be re-christened to facilitate sales on this side of the world. It is a foolish fad, however, to name plants after nobodies on either side of the Atlantic. The great men

and women of the world may well have plants named in their honor, but in all such cases a single word is sufficient to indicate the one honored. When it becomes necessary to distinguish the one honored by a string of names as Mrs. John H. Smith, the practice becomes absurd. It would be well to frown on the practice of giving German names or the names of non-Germans to

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An abridged edition will be forwarded to garden lovers who do not have a copy of the regular Sixth Edition, issued in 1919.

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plants unless the ones for which they are named are already distinguished.—*American Botanist*.

SOIL VENTILATION

It is curious how the discoveries of the scientific agriculturist confirm the accepted practice of the gardener. The illustration of this fact consists in the recognition that ventilation, that is to say aëration, is a factor of first importance to the growth of field crops. The deep and thorough cultivation as practiced by gardeners, the constant stirring of the soil, the incorporation with the soil of gritty material, all serve among other things to supply plenty of air to the roots of plants.

There is evidence that this abundant supply of air is beneficial in numerous ways. Firstly, of course, because, roots, like all other parts of plants, require oxygen for their growth. Secondly, a constant circulation of air allows of the escape of the carbon-dioxide given off by the roots. It appears to be well-established that an excess of carbon-dioxide in the soil results in a check to the growth of roots. Indeed, roots seem to be peculiarly susceptible to injury from carbon-dioxide. Thirdly, it cannot be doubted, but that a good supply of air favors the activity of beneficent soil bacteria.

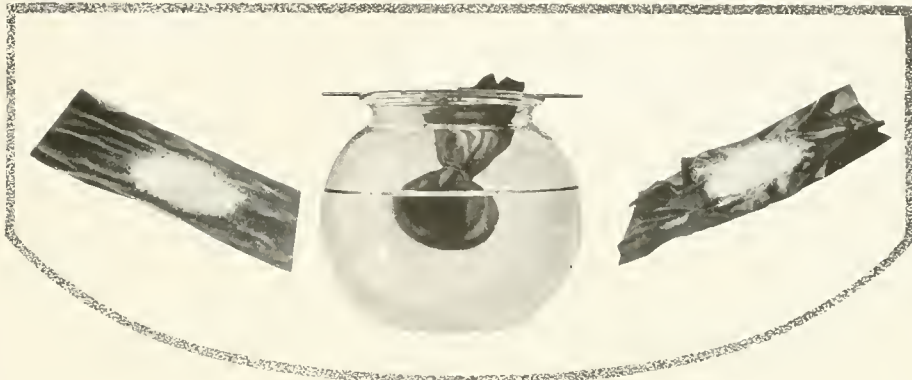
It is, of course, evident that deep cultivation has other advantages as well as that of providing "root ventilation." It increases the water-holding capacity of the soil, improves drainage, and helps to liberate larger stores of plant food. Anything, therefore, which helps to induce the agriculturist to practice more widely a system of deep tillage is bound to be to his benefit and to the benefit of the world at large.

THE KEYED LIST

The landscape architect stands at his drawing table and proceeds to fill in his plan and key the planting. His mind is concentrated upon producing a picture for his client. If he is a good plantsman and knows his material well, from whence it can be procured at the proper time and in the right grades, the materialization of his picture will proceed apace, but too often his training has been along lines that has only given him a casual acquaintance with plants, he knows little or nothing about their habits or requirements, depending on book or catalog description, and his efforts fall very short of his aim.

The keyed list may be properly termed a mechanical effort to produce landscape art. The very nature of plants forbids that it will ever be a complete and successful method. It never can be anything more than a starting point, framework, or skeleton of the picture in the mind of the artist, and unless the man who actually carries out the plan has plenary powers to substitute, adjust as conditions may require and is thoroughly interested and an able gardener. —National Nurseryman.

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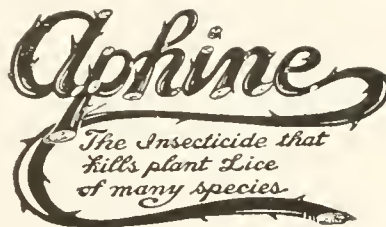
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Strong and indestructible
made of heavy tin.
Delivers a large volume of
mist spray in any direction
desired.



No. 1 Atomizer
Continuous Sprayer.
Three times faster and lots
easier to work—furnished
with two interchangeable
brass nozzles.



**Niagara Compressed Air
Sprayer Has No Equal**
Easier to operate. More
Powerful Brass Pump,
durable Galvanized
Steel Tank. New
Design Nozzle,
Hose cock to
regulate fine-
ness of
spray.

With the NIAGARA HAND DUST GUN and NIAGARA "All-In-One-Dust-Mixture"

Dusting kills insects, pests, and controls fungus diseases without the sloppy, mussey bother of mixing various chemicals with water and making various solutions for different pests.

Niagara "All-in-One-Mixture" is a clean flour-like dust which contains fungicide poison, and contact insecticide in combination. So a single application fights all classes of insect pests and fungus diseases.

The dust is placed in the hopper at the end of the Niagara Dust Gun and by short easy strokes of the piston blow in a thin cloud over the plant. There is no chance of soiling or spoiling the clothes and the entire outfit is so light and easy to operate that any woman or child can rid the garden or greenhouse of plant lice, green worms, potato bugs, mildew, etc., etc.

Niagara Hand Dust Gun—One Pound of Niagara "All-in-One-Mixture" and the Niagara Garden Guide are all packed in a single attractive carton for sale by dealers everywhere.

IF YOUR DEALER CANNOT SUPPLY YOU WRITE US.

We also manufacture a complete line of hand sprayers and atomizers of the highest quality.

NIAGARA SPRAYER CO.

16 Main Street, Middleport, N. Y.

Manufacturers of Power and Hand Dusting Machinery for Orchard, Vineyard and Field. Special Dust Mixtures. All kinds of spray materials and sulphur.

To Dealers: If you have not already investigated, write at once.





*William Carter,
Superintendent estate
of Edward H. Bindley*

*View of Estate of Edward H. Bindley,
"Quinnepeag," New London, Conn.*



The Tribute of William Carter to Davey Tree Surgery

New London, Conn.

The Davey Tree Expert Company, Inc., Kent, Ohio.

Gentlemen: Regarding work done this spring at Mr. Edward H. Bindley's estate, "Quinnepeag," New London, would say that trees were neglected for thirty years and in extremely bad condition. The Davey operatives under your foreman did splendid work. The filled cavities are healing beautifully and the whole operation is a great credit to your methods and men.

Your foreman and his young men made a fine impression by their very gentlemanly conduct, strict attention to business and general efficiency. Mr. Bindley is immensely pleased with the operation and I gladly testify to the excellence of your service. We shall be glad to have your men return next spring when Mr. Bindley wishes all the trees properly cared for.

Very truly yours,

WILLIAM CARTER, Superintendent

The saving of priceless trees is a matter of first importance on every estate. Davey Tree Surgery is a fulfillment of the maximum expectations of those who love and value trees. A careful examination of your trees will be made by appointment.

THE DAVEY TREE EXPERT CO., Inc., 302 Elm Street, Kent, Ohio

Branch Offices with telephone connections: New York City, 225 Fifth Ave; Chicago, Westminster Bldg., Philadelphia, Land Title Bldg., and Boston. Write nearest office.

Permanent representatives available in districts surrounding Boston, Springfield, Lenox, Newport, Hartford, Stamford, Albany, Poughkeepsie, White Plains, Jamaica, Montclair, New York, Philadelphia, Harrisburg, Baltimore, Washington, Richmond, Buffalo, Toronto, Pittsburgh, Cleveland, Detroit, Chicago, Milwaukee. Canadian address, 252 Languechiters West, Montreal.

"The filled cavities are healing beautifully," writes Mr. Carter. Note how the concrete has been placed in the cavity, section by section, to allow for swaying and prevent cracking.



*John Davey,
Father of Tree Surgery*

DAVEY TREE SURGEONS

Every real Davey Tree Surgeon is in the employ of The Davey Tree Expert Co., Inc., and the public is cautioned against those falsely representing themselves.

GARDENERS' CHRONICLE

(OF AMERICA)

ILLUSTRATED



Section of
Experimental
Garden

*John Scheepers Inc.
New York*

A
HORTICULTURAL
DIGEST

\$2.00 A YEAR

25c A COPY

GLASS GARDENS



Charming, isn't it! Of course you could swing the greenhouse around and join it directly to the garage doing away with the connecting house and the entire gable end of the greenhouse. That's for you to say. Mr. W. S. Duling, of Mt. Airy, Pa., owns this one.

—HERE'S AN IDEA— BUILD A GREENHOUSE TO YOUR GARAGE

Here is your answer to that longing you have long had for a jolly little glass garden of your own.

A garden under glass, where you could not alone have that rare pleasure in sort of fooling Dame Nature by growing things regardless of the seasons. But a garden that is right down practical.

An inside garden, that among other things, will help your outside garden to be weeks earlier and lots better.

A garden where you can bring part of your outside garden in, when Jack Frost comes prowling around.

A garden that can be attached right to an existing garage; or built along with one you may be planning.

Done either way, the one boiler can heat them both, at a saving for both.

The one of Mr. Duling's above, shows how it can be joined to the garage by a little connecting house.

Just how it shall be, however, depends on your garage, your ground space, and you.

By you, we mean what you particularly want to do with your greenhouse; and how much you want to invest in it, with an assurance that it will yield you perpetual dividends in joy and satisfaction. Yes, and in real money, besides.

All of which can be decided after we hear from you. Send along a photo of your present garage; or a blue print or sketch, if it's to be a new one.

And don't forget to give its size, and the amount of ground space around it.

Oh, yes, and another thing; remember that we will if you prefer, do all the greenhouse work, which means not only furnish materials cut and fitted ready for quick erection; but do everything, from turning the first shovel of dirt; to turning on the heat, all ready for your flower friends.

Lord & Burnham Co.

Builders of Greenhouses and Conservatories

IRVINGTON
New York
BOSTON
Little Bldg.

NEW YORK
42nd St. Bldg.
CLEVELAND
2063 E. 4th St.

PHILADELPHIA
Land Title Bldg.
TORONTO
Royal Bank Bldg.

CHICAGO
Continental Bank Bldg.
MONTREAL
Transportation Bldg.

Eastern Factory
Irvington, N. Y.

Western Factory
Des Plaines, Ill.

Canadian Factory
St. Catharines, Ont.

Joseph Manda Company

NEW CROTON

Marine Manda

Beautiful and distinct Croton of the acubæfolia type having 3 lobes instead of oval leaf as in the acubæfolia. We are booking orders for this grand novelty. Spring 1921 delivery at the following prices:

3 in., \$2.50 each; 4 in., \$3.50; 6 in., \$5.00. Orders filled in rotation.

Orchids

Special Offer to Beginners

In order to introduce our stock of orchids, we offer this month only 12 plants in 12 various selections, \$50.00.

Palms

We have fine stock of all the leading varieties such as Kentias, Areca, Lattania, Phoenix and Cocos in 2½ to 12 inch tubs in single and combination plants.

Ferns

All the leading Nephrolepis in all sizes, including the new "Victory" and Macawii. Fine assortments for fern dishes in 2¼, 3, 4 inch pots.

Asparagus

Splendid lot of well grown stock in 2¼, 3, 4 inch pots. Plumosus, Sprengerii Elegans.

Cannas

We can supply all the leading novelties, also the standard kinds in dormant or 3 or 4 inch pots.

Lily of the Valley

Best Berlin Pips

Lilium Giganteum

Cold Storage

"Let Us Bid On Your Wants"



ORCHID EXPERTS

Plants—Bulbs—Sundries

West Orange - - - New Jersey

William J. Manda
Vice-Pres.

Joseph Manda
Pres. & Treas.

Edward A. Manda
Sec'y.

Stumpp & Walter Co.'s Catalog

Our 1920 Spring Catalog will be mailed to you on request, if you have not already received a copy.

Many New and Exhibition varieties of Flower and Vegetable Seeds are offered. Farm and Grass Seeds are also a feature. Cannas, Dahlias, and Gladioli---the best varieties to date.

Stumpp & Walter Co.

30-32 Barclay St.
New York





A Giant Everbearing Quality Fruit which the U. S. Dept. of Agriculture states, "should be tried in gardens in all parts of the country."

La France

King of Raspberries

(Everbearing)

Raspberries from June to November! From your own garden to your own table! La France Everbearing Raspberry is Scheepers' latest introduction to the world of horticulture. Immense clusters! Giant berries—twice the size of the ordinary varieties! Firm, luscious fruit; deep colored, wonderfully rich-flavored! And few seeds!

Tested and Proved for Three Years—Continuous Crop—Easily Propagated

La France Everbearing is a remarkable plant. Its hardiness and habits—its prolific bearing qualities, and its ease of propagation—make it a horticultural phenomenon.

Planted early in the spring, it loses no time getting started. Begins bearing as early as the first week of July (the first season!) and "never lets up"—keeps right on with break after break, cluster-laden shoots, until all vegetation is completely frost-checked for the season. Even then its remarkable nature continues in evidence: La France has demonstrated its hardiness by surviving temperatures as low as 30° below zero.

La France Everbearing Raspberry propagates freely and very rapidly. A dozen plants will produce a good-sized berry patch in an incredibly short time.

Its rapid growth, its hardihood to withstand extreme cold, its immunity from fungus and insect diseases, its remarkable all-season production of fruit, make La France Everbearing by all odds the raspberry for home gardener, fruit grower or farmer.

**Now's the Time to Order.
Supply is Very Limited.**

Plant La France early this spring and have berries the first days of July. But order now. Six plants for \$10.50. Twelve plants for \$20. One hundred plants for \$150.

**JOHN SCHEEPERS, Inc.
2 Stone St., New York City**

Nurseries—Sound Beach, Conn.; Brookville, N. Y.

Write for booklet on "La France Everbearing Raspberry." Includes additional expressions from noted horticulturists, etc.

LA FRANCE FIRST-CLASS AWARDS

Massachusetts Horticultural Soc.—New York Florists' Club—"Horticultural Soc. of New York"—Morris County Horticultural Soc.—Tarrytown Horticultural Soc.—The American Institute, New York—Nassau County Horticultural Soc.—Fairfield and Westchester Horticultural Soc.
*And Silver Medal. Also other Show and Fair awards wherever exhibited.

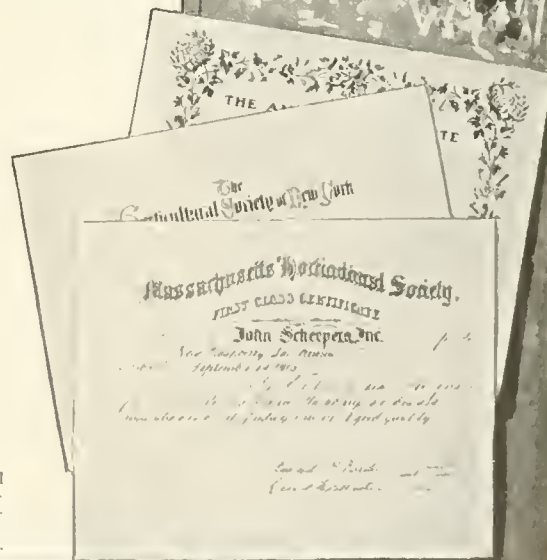
What a few La France growers say:

T. A. Havemeyer, Pres. Hort'l Soc. of N. Y.—
"Far superior to any other raspberry. Very prolific. Large clusters. Luscious berries. A remarkable plant. Should be grown by every garden owner, fruit grower, farmer, nurseryman."

F. A. Bartlett, Tree Specialist, Stamford, Conn.—
"The finest acquisition in years. Winter of 1917-18 killed all my varieties except La France."

Wm. Ziegler, Great Island, Conn.—
"La France 8-ft. canes loaded with large clusters. Shall discard all other varieties and grow only La France."

J. B. Cobb, Stamford, Conn.—
"Produces large crop for almost four months. Consider La France King of Raspberries."



OUR NEW CATALOG

Showing Eight of our Varieties of Gladioli with Natural Colored Plates

is just out and if you are not on our mailing list already, write for it at once—it is free upon request. Anyone who is a lover of flowers should not fail to have a copy of it; it's a little book worth having in one's library, containing instructions how to plant and care for Gladioli as well as for Petunias.

Our Gladioli are of a finer quality than ever before and our many varieties surpass any in existence. The THOMAS T. KENT, ANNA EBERIUS, JACK LONDON, MRS. JOHN WALSH and others which you will find in our catalog speak for themselves without the hundreds of testimonials that have been pouring in upon us continuously.

Diener's Ruffled Monster Petunias

have created a sensation wherever grown or exhibited. As they are continually flowering all Summer there is hardly anything giving flower-lovers more satisfaction. Seed comes in separate colors—red, pink, white, purple, flesh-pink frilled, white frilled, variegated and mixed colors. Price per package, 50c.

RICHARD DIENER CO., Inc. **Kentfield, Marin Co., Cal.**

Sutton's Seeds



Here's Your Chance to Prove What They'll Do

Maybe you've been trying to get the folks to try Sutton's Seeds

Maybe they've sort of put it off, because they never used them before.

Here are four collections carried in stock by our American Agents.

✓ So you can get them *at once*.

They include many of our best and newest varieties, a rare treat for garden lovers.

The collections are:

Flower Seed Collection—A—40 varieties, prepaid..... \$5

Flower Seed Collection—B—25 varieties, prepaid. . . \$3
Vegetable Seed Collection—C—44 " " \$5
Vegetable Seed Collection—D—34 " " \$3

Why not arrange to order one of each of the flower and vegetable sets, just to test them out?

The Sutton Catalog sent free with each collection.

Otherwise it's 35 cents, which is returned with a \$5 order. To you who are gardeners, we will send it free if you will enclose your employer's letter head.

Our Booklet "SEEDS" is full of seed facts you should know. It's free for the asking.

H. P. WINTER & CO.
66-C Wall St., New York

Sutton's Sons

Seed Growers and Merchants

Reading, England

THE S. T. BLAKE CO.
431-C Sacramento St.,
San Francisco, Calif.

BURNETT BROS. RELIABLE SEEDS

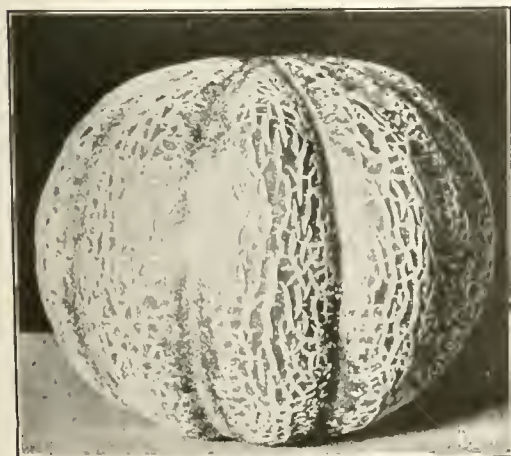
A Few
of Our
Many
Specialties
for
1920



"Westchester Pryde" Tomato. Pkt. 25c., 5 pkts. \$1.00. A Handsome Table Variety



"Silver King" Lettuce. Pkt. 20c., oz. 50c.



Burnett's "Discovery" Musk Melon. Pkt. 25c.
5 pkts. \$1.00

"Burnett's Prize Winners"

BEANS

Sutton's Masterpiece, Pt. \$1.25, Qt. \$2.00

BRUSSEL SPROUTS

Burnett's Supreme, Pkt. 15c, Oz. 50c

CARROT

Improved Long Red Surrey, Pkt. 15c, Oz. 50c

CAULIFLOWER

Snowball. "Burnett Selected Strain"
Pkt. 25c, ¼ Oz. \$2.00, Oz. \$6.00

LEEK

Waverley Market, Pkt. 20c, Oz. 75c

ONION

Ailsa Craig (Selected Stock)
Pkt. 25c, Oz. \$1.00

NEW PARSLEY

Burnett's Emerald Isle
Pkt. 10c, Oz. 30c, ¼ lb. \$1.00

PARSNIP

Hollow Crown Improved, Pkt. 5c, Oz. 20c, ¼ lb. 60c

PEAS

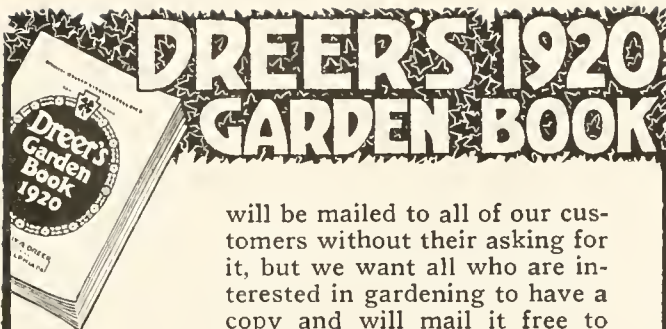
Alderman, Pt. 60c, Qt. \$1.00

See our new Illustrated Spring Catalogue now ready—mailed free.

BURNETT BROS., Seedsmen

The House Famous for Lawn Grass Seed

92 Chambers St. Between Broadway and Church St. NEW YORK



DREER'S 1920 GARDEN BOOK

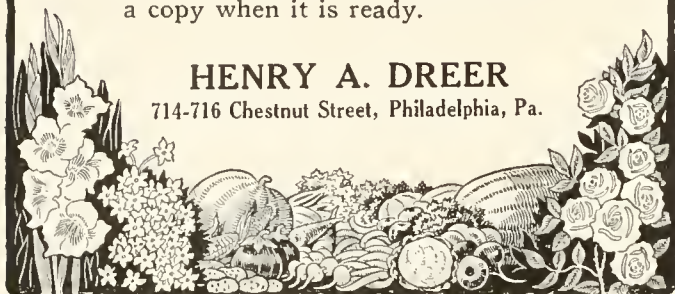
will be mailed to all of our customers without their asking for it, but we want all who are interested in gardening to have a copy and will mail it free to those who mention this publication when writing.

DREER'S GARDEN BOOK FOR 1920 contains 224 pages, six color plates featuring Choice Vegetables and Flowers, also hundreds of photo-engravings, together with cultural notes written by experts, making it a dependable guide on all matters relating to Vegetable and Flower growing.

Write today and we will gladly send a copy when it is ready.

HENRY A. DREER

714-716 Chestnut Street, Philadelphia, Pa.



THE STORE OF Complete Garden Service

Since 1877 we have served buyers of discrimination with the choicest products our line affords. Service and quality have been the keynotes, rather than price. You will again find this the predominating factor in the Spring issue of

Beckert's Guide to Better Gardens

Like former issues, it offers the choicest products of America, Europe and Asia, in seasonable Seeds, Bulbs and Miscellaneous Garden Requisites. You will find our prices modest, our assortments comprehensive, our service beyond reproach. Try us on the basis of fair prices for quality goods and top-notch service. Your copy of our latest catalog is awaiting your call.



Beckert's Seed Store
101 and 103 Federal St.,
Pittsburgh Pa.



Next Month You'll Be Busier—Better Look Into It Now

Irrigation is just as essential to assured garden success as good seeds or manure and fertilizer, or proper spraying.

Your garden cannot possibly succeed without plenty of water.

You know that next July and August, your employer will be looking for results, not excuses.

So put it up to him, now, to provide for rain when you need it.

Skinner irrigation works anywhere; automatically waters any size garden, on level or grade.

Costs less than hose.

Send for our new Book on Irrigation for the Home Grounds.

The Skinner Irrigation Co.

229 Water Street,

Troy, Ohio



BOBBINK & ATKINS

VISIT
NURSERY



ASK
FOR
CATALOG

You will need tubs this Spring—Buy Good Ones—
Real Heart Cypress

Order Them Now

While we have time to make them at once

RUTHERFORD

NEW JERSEY



The Erskine Park Everbearing Red Raspberry



"The Dessert Berry of the Nation"

FOR SPRING PLANTING—Strong Field Grown Bearing Plants, \$3 per 6; \$5 per dozen; \$30 per hundred

*Send for our Free illustrated Catalogue which describes
the "WORLD'S BEST" trees and plants for your garden.*

GLEN BROTHERS, Inc., Glenwood Nursery, 1923 Main St., Rochester, N.Y.

was discovered on the Westinghouse Estate (Erskine Park) at Lee, Mass., by Mr. Edward Norman. This magnificent estate is in the midst of the beautiful Berkshire Hills, with a temperature in winter of 30 or 40 degrees below zero, so that the hardness of this berry is unquestioned. The estate is surrounded by the summer homes of many wealthy people, and much to the surprise of his neighbor gardeners and not without a deal of personal satisfaction, Mr. Norman furnished large, luscious raspberries throughout the fall for various dinner parties.

These berries are commented on by all who have seen and tasted them as the most delicious and best raspberry they ever have eaten. Mr. Baker, of Hoosick Falls, N. Y., writes us as follows:

"In the season of 1916 Mr. George M. Darrow, of the United States Department of Agriculture, was traveling from the Atlantic to the Pacific, visiting fruit growers to obtain information on berries for bulletins published by the Department of Agriculture. Mr. Darrow had visited this estate before, and was most favorably impressed that this berry was far ahead of the St. Regis and Ranere, and when it became known it would replace these varieties. The plant is by far the strongest growing raspberry I have ever seen. It branches like a tree, and it also has the largest and most roots of any variety with which I am acquainted. It is perfectly hardy and the berries are very large."

Conceive the joy and satisfaction of having such berries on your table all through the Autumn, a source of wonder to your neighbors, that you can pick the finest raspberries until the snow lies. On November 20th we cut a large branch of the Erskine Park with blossoms, green berries and ripe fruit upon it.

MICHELL'S



GRASS SEEDS

will produce a thick, velvety lawn in from four to six weeks from sowing.

No better quality seeds, nor more perfectly blended varieties than those used in MICHELL'S GRASS SEED MIXTURES can be had, because our contract arrangements with Foreign and American growers enable us to make purchases that are absolutely right as to variety, quality and price.

OUR 1920 CATALOG

is a safe guide to the best mixture for every purpose—shaded lawns, terraces, seashore properties, golf courses, public parks, pastures, etc., as well as interesting facts concerning the Vegetable and Flower Garden.

WRITE TODAY FOR A COPY

MICHELL'S SEED HOUSE

514 MARKET ST., PHILA. PA.

"A Garden for Every Home"

Nursery Grown

RHODODENDRON MAXIMUM

(Specimens)

4' x 5' high, 4' x 5' spread

Collected

RHODODENDRON MAXIMUM

and

RHODODENDRON CAROLINIANUM

All sizes in carload lots

PRICES ON REQUEST

Muller-Sealey Co., Inc.

*Horticultural
Specialists*

145 West 45th Street, New York City

Tel. Bryant 9141

Hardy Everblooming ROSES

We have on hand over 75 varieties of the very best Hybrid Tea Roses. All strong 2-year-old plants that were lifted last Fall and are now heeled-in in cellars.

These are in excellent condition and will insure a wonderful display of bloom this season.

Consult us before buying. Write for our descriptive catalogue.

W. E. MARSHALL & CO.

Nursery Department

SEEDS—PLANTS—BULBS

166 W. 23rd St., New York

CROMWELL GARDENS HANDBOOK

Is ready to mail now and you may have a copy upon request. We are offering the best varieties of

Bedding Roses

Hardy Perennials

Bedding Plants

Evergreens and

Nursery Stock

A.N. PIERSON INC.

CROMWELL GARDENS
CROMWELL CONN

AN APOLOGY TO MR. J. OTTO THILOW

Business has to be founded on truth, if it is to survive. It is for the love of truth the forthcoming explanation is submitted.

In considering the purchase of "Melrosine," the new Rosebug insecticide from Mr. Hugh B. Barclay, a private gardener of Merion, Pa., the testimony of those who tried it previously and had approved its merit by both word and letter was of utmost importance to decide upon its real value, and to present the merits of this article in a verified fashion to the public during the year of introduction. Mr. Barclay enjoys the reputation of a gentleman, whose word has never been questioned by those who know him.

Among the names as referred to above was that of Mr. J. Otto Thilow of the Henry A. Dreer Co. of Philadelphia. Upon seeing his name mentioned in connection with the offer of "MELROSINE," Mr. Thilow protested against this, claiming that he never tried "MELROSINE," nor has given any testimony as to its merits.

As Mr. Thilow enjoys the reputation of an eminent Horticulturist and a gentleman, whom I respect equally well as to veracity, I feel that my sense of courtesy dictates to me to let the inexperience of youth bow to the reverence of age and to offer to Mr. Thilow this public apology for whatever I have committed in the premises, which hurt his feelings or injured his interests.

MAURICE FULD.

In fairness and justice to Maurice Fuld and myself I am compelled to state here publicly that Mr. Fuld is absolutely blameless in the use of Mr. Thilow's name as an endorser of "MELROSINE," having acted upon the statements of facts as given to him by me and if any blame is to be attached to anyone I am willing to accept that blame and responsibility. But in order to be judged impartially and fairly by the gardening fraternity, I feel it my duty to present herewith an explanation of my action.

Mr. Thilow acknowledges having received a sample of the insecticide for test in May, 1918, but claims he has not tested it or given any approval of it.

My memory which has always served me in the past, tells me that at a certain meeting of the Philadelphia Florist Club held on the Roof Garden of the Hotel Adelphi in the Spring of 1919, Mr. Thilow approached me with the request that I prepare an article on some subject for a future meeting of the club. My reply was that I feared I could not write anything of interest to Florists unless it were something about my Rosebug Insecticide and then requested of him, how his tests of the remedy proved. He replied, "Oh, it's all right: it's all right."

The word of a gentleman once uttered I never question and I believed that this statement of Mr. Thilow's justified me in adding his name to the list of other endorsers from some of whom I also have only their spoken word.

I desire to here publicly apologize for using Mr. Thilow's name without first consulting him and securing his permission.

HUGH B. BARCLAY.

We Still Have Many Testimonials Which Cannot Be Repudiated

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Published monthly,
the 1st of each month.

THE CHRONICLE PRESS, INC.
286 Fifth Avenue, New York, N. Y.
MARTIN C. EBEL, Editor

Subscription . . . \$2.00 a year
Canada, \$2.15; Foreign \$2.65

Entered at the New York Post Office as second class matter under the Act of Congress, March 3, 1879.

The Inviolability of Our Advertising Columns

SINCE the GARDENERS' CHRONICLE has come under control of its present ownership it has been its policy not to knowingly accept any advertisements containing misrepresentations or that make offers which the advertiser cannot live up to.

In the February number of the GARDENERS' CHRONICLE an advertisement was published which bore the names of a number of men widely known in the field of horticulture as endorsers of a certain product. Before the advertisement was accepted the advertiser was consulted as to whether he possessed written testimonials of the parties and he replied in the affirmative. After the advertisement appeared the publishers received the following communication:

"In an advertisement in the February edition of the GARDENERS' CHRONICLE, under the head of Melrosine, I notice my name is published among the list of testimonials. I beg to say that I never subscribed to this, never tried Melrosine, and never gave sanction as an endorser of its merits. J. Otto Thilow."

The GARDENERS' CHRONICLE on receipt of this communication called on the advertiser to correct the statement in his advertisement and directs the attention of its readers to this correction and to Mr. Maurice Fuld's apology to Mr. J. Otto Thilow appearing elsewhere in the advertising columns of this issue, as it feels obligated to inform its subscribers of and protect them against any misrepresentations it may uncover in its columns.

The GARDENERS' CHRONICLE warns those concerns who, taking advantage of the opportunities created by the growing interest in gardening in this country, are invading the field of horticulture and conducting business on the theory that there is a new dupe born every minute that they evade the advertising columns of the GARDENERS' CHRONICLE, for any imposition against its readers will be promptly and fearlessly exposed.

The Chronicle Press, Inc.

GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

LIBRARY
NEW YORK
BOTANICAL
GARDEN

Vol. XXIV

MARCH, 1920

No. 3

Things and Thoughts of the Garden

THE ONLOOKER

"—the fairest flowers o' the season
Are our carnations."

—*The Winter's Tale*, IV, 4.

So wrote the Bard of Avon more than three hundred years ago, and the same sentiment is voiced today by many an ardent admirer of the Divine Flower. This reverential title comes from the generic name of the carnation, *Dianthus*, "from *dios*, divine, and *anthos*, a flower; the name given by Theophrastus, in allusion to the exquisite fragrance of the blossoms of most of the species," to quote from Nicholson's Dictionary of Gardening.

This establishes the carnation as a flower of ancient lineage, as Theophrastus, who was a Greek philosopher and botanist, lived some three hundred years before Christ. There is abundant evidence to show that the carnation has long been regarded with much favor as a garden plant, although its earliest history as such seems to be somewhat obscure. But it is quite clear that it was a well-known plant in English gardens of the sixteenth century, and the evolution from a single five-petaled flower to handsome double varieties was an accomplished fact at that time. Gerard wrote in 1597 that "every clymate and countrey bringeth forth new sortes," and Parkinson in 1629 stated that "the number of them is so great that to give several descriptions to them all were endlesse." The old English name was Gillyflower, of which there were numerous quaint spellings, and the name carnation appears to have been first used to distinguish a deep red color.

Parkinson is credited with the first attempt to classify the varieties. The largest kinds he called carnations, the smaller ones gillyflowers, and all those with flowers of yellow shades he classed as "Orange Tawnies." This type originated in Silesia, and its introduction into England gave the growers there something which had hitherto been lacking, and that was good seed producers. Their influence was soon shown, old sorts were discarded for new, new sections were formed, and the flower greatly increased in popular favor. It is interesting to learn that at one time those kinds which developed a split calyx were regarded with most favor. These were called Bursters, and those with a non-splitting calyx were known as Whole Blowers. It was not until the eighteenth century was well along that the latter gained first place in popular esteem, which they have maintained ever since. Some of the good points of a fine double carnation are set forth in Loudon's Encyclopædia of Gardening, published in 1835, as follows: "The stem should be strong, tall and straight; not less than thirty or more

than forty-five inches high. The flower should be at least three inches in diameter, consisting of a great number of large well-formed petals; but neither so many as to give it too full and crowded an appearance, nor so few as to make it appear too thin and empty. The calyx should be at least one inch in length, terminating with broad points, sufficiently strong to hold the narrow bases of the petals in a close and circular body."

Hogg in 1820 issued a catalog of 350 good sorts which were in his possession, and writing in praise of the carnation as a garden flower states that "The tulip, though styled the queen of the garden, cannot boast of more admirers. They may with propriety be considered the two masterpieces of Nature."

* * *

Referring to the Standard Cyclopedia of Horticulture we find it stated that about 250 species of *Dianthus* are known to botanists, and of these the most noted is *D. caryophyllus*, a native of southern Europe, and recorded as the original parent of all the carnations. We find that distinctive strains were developed in different European countries, and as the result of cross-breeding various well-defined sections were developed. In Great Britain the Bizarres and Flakes, parti-colored flowers, each with their sub-divisions of color, were for a long time the ideal of the old school of florists. Later on the Picotees, Fancies and Selfs had their day of popular favor. These were all summer bloomers and mostly flowered in the open air, although some enthusiastic cultivators did grow plants in pots under glass for exhibition blooms. For a time in the latter part of the last century the Malmaison type was very popular in Britain. Wonderful flowers these were when well developed, but according to general experience it was one of the most uncertain plants to grow. Many a good plantsman struck a snag on Malmaison culture, and few growers really ever mastered its peculiarities.

* * *

But of late years the American carnation has taken the leading place across the seas, and this distinctive type, known also as the Perpetual, and winter-flowering section stands pre-eminent in the world today for all-round excellence. The story of its development will stand as one of the most notable chapters in the history of American floriculture. It is a descendant of a French strain which was derived from the so-called Tree Carnation about the middle of the last century, and to a French florist named Charles Marc, who was located on Long Island, belongs the credit of being the first to introduce

seedlings of the new type to this country. This was in 1852. A few years later the noted firm of Dailedouze and Zeller, of Flatbush, Long Island, commenced the work of carnation breeding in America, which has proved to be an epoch-making event in the history of this wonderful flower. Other florists soon began to have a hand in its development, and among them we find some of the most noted names in American horticulture. Hundreds of varieties have been raised and disseminated, many of them short lived and falling short of expectations it is true; but we find a number of noteworthy sorts which held their own for several years before finally giving way in the march of progress. Undoubtedly the variety which caused the most sensation was Mrs. Thos. W. Lawson, or the "Lawson," as it was popularly known. This variety had the unusual distinction of a commercial flower, receiving sensational write-ups in the daily papers. This was twenty years ago, and for several years it was the standard variety here and in Europe, and I believe is still grown today. Mr. Peter Fisher, of Ellis, Mass., will be forever famous had he raised but this one variety, but he also gave the world the famed Enchantress and such well-known sorts as Beacon and Benora among others.

The latest sensation is the variety "Laddie," from the house of Dorner, a name famous in American carnation history. As grown and shown by that expert carnation grower, Mr. S. J. Goddard, this variety is certainly a wonder, and sets a notch higher the standard for raisers to aim at. After nearly three-score years and ten the American carnation has achieved a leading position as a commercial flower, and is the stand-by of all who have to maintain a supply of cut flowers during the winter months. Summing up, we see the carnation as a flower which in its various forms has been held in high regard for centuries past, is universally popular at the present time, and undoubtedly will be held in the highest esteem for a long time to come.

* * *

It is interesting to note the recent introduction of a new race of *Dianthus* in England which is described as half carnation and half pink. This new race is called *Dianthus Allwoodii*, after the raisers, Allwood Brothers, well known carnation growers in England. It is reported to be in big demand there, and promises to be a remarkable acquisition to the list of garden plants of which it is said "anyone can grow." From what we can learn the habit is very similar to that of the garden pink, and the flowers have the delightful perfume of that old garden favorite. It is said to flower continuously from Spring till Autumn, and there are varieties of double and single flowers in a wide range of colors. Altogether, it would appear to be the most interesting flower novelty of recent years, and we shall await its appearance here with a good deal of interest.

* * *

In some greenhouses there is a certain amount of wall space showing which, if not covered, detracts from the good appearance of the interior. Oftentimes there is opportunity for the display of some climbing plant that would be a special feature at some particular time, and which otherwise could not be accommodated. If a perpetual wall of living green is desired the climbing fig, *Ficus pumila*, is a first rate plant for the purpose, and so far as I have observed is never subject to insect pests. One of the best walls of green I remember to have seen was in a cool greenhouse with a northern exposure, the lack wall of which was covered for the entire length and from floor to roof with Maidenhair Fern, *Adiantum*

cuneatum. The method of attachment was by means of zinc troughs a few inches deep and fastened on the wall a foot or so apart. Not only did it look well, but also served the very practical purpose of supplying plenty of fronds for picking from space that might easily have been wasted.

* * *

A pleasant pastime to enable one to forget for a while the climatic capriciousness of a New England winter is to read books on tropical countries. One I have lately enjoyed reading is "A Naturalist in Nicaragua," by Thomas Belt, who must have been one of the most observant of men. Among a lot of interesting happenings in tropical life which he graphically describes is the story of a working partnership between a plant and a species of ant. The plant provides board and lodging for a certain season in return for services rendered. This striking occurrence of mutual help is recorded of several tropical plants. In this particular instance the plant is *Acacia sphaeroccephalia*, a common plant in Nicaragua, where it is known as Bull's-Horn plant. On the trunk and branches are numerous pairs of strong, curved thorns. These thorns are hollow and tenanted by ants, which pass in and out through a hole at one end. These ants are described as small, but very fierce and aggressive, and the service they render is in repelling of leaf-eating animals, for which they receive food as well as lodging. Their food they obtain from the leaves, but not by eating them. The leaves are bi-pinnate in form, and along the mid-rib, at the base of each pair of leaflets is a gland which secretes a honey-like liquid of which the ants seem to be very fond. But this is not all; a more solid food is provided. When the leaflets first unfold there is on the top of each leaf division a small yellow fruit-like body, for all the world like a tiny golden pear. The ants examine these continually until they are ripe, and incidentally do any fighting that may be necessary for their protection.

When the fruit is ripe it is broken off by the ants and carried home to the nest for consumption. After the leaflets have fully developed the danger of their being chewed up is over for that season. I have observed this plant in botanical gardens and noted all these features, with the exception of the fighting ants and the chewing animals, their places being taken by ants of seeming pacific tendencies and a sucking insect—the mealy bug.

* * *

One of the advantages of a botanical garden is, that there one may find many plants which, while not of popular interest, none the less excite the curiosity at least of many people who see them. One of these I recall is a curious lilaceous plant from South Africa, *Bowiea volubilis*, a bulbous plant of twining growth, giving one the impression from a casual glance that someone had effected a cross between a giant onion and an asparagus. It would be an interesting plant for the amateur's greenhouse, but probably it is not offered by any of our plant-men.

Do not crowd ideas in speaking or writing.

Before you try to convince anyone else, make sure that you are convinced, and if you cannot convince yourself, drop the subject. Do not try to "put over anything."

Tell the truth.—Northern.

INTERNATIONAL FLOWER SHOW
NEW YORK—MARCH 15-21

Making the Home Garden Productive*

EDWIN JENKINS

OF the many changes wrought upon our national life by the great war, none has had a more beneficial effect than the increased interest in the Home Garden and none is more worthy of perpetuation. For in addition to countering, in some measure, the H.C.L.—its effect upon the general health and welfare of the people will be tremendous.

To those who have eaten the home-grown, fresh vegetables, it will be unnecessary to expatiate upon their superiority in comparison with the purchased product, but for the benefit of those to whom this blessing has been denied I would say, that there is almost as much difference between the sweet-corn, peas, beans, and many other vegetables that you may gather from your own garden, and cook within a short time of picking, as there is between day and night—there is simply no comparison.

Fertility.—In making the Home Garden more productive, one of the first considerations is fertility.

A garden that is of low fertility would take the heart out of the most enthusiastic and ardent gardener, for the crops will be stunted, poor flavor, and in every way, unsatisfactory.

The very best manure for the garden is rich, well decayed farm yard manure, applied in large and impressive doses. You hardly need fear putting too much on. This well-rotted manure should be incorporated with the soil by digging and mixing in. Fertility, coupled with plenty of water and sunshine, is the foundation of rich-flavored, succulent vegetables.

Where it is difficult or impossible to obtain manure, the next best method is to supply the much needed humus by digging in leaves or other decayed vegetable matter, and then using a good dressing of any of the standard brands of commercial fertilizer.

Seeds and Seed-sowing.—Get a seed catalog of a reliable seed-house, and study it. You will find much useful information therein. Make up your mind what you would like to grow. Order early, so as to have it on hand. Seed will keep in any dry, cool place, if protected from mice.

Varieties.—A few suggestions as to varieties for the Home Garden will probably be of service to some.

BEANS—(Dwarf, String) Early Red Valentine, Longfellow, Limas, Fordhook, Bush. Yellow—Golden Wax Improved.

BEETS—Early Eclipse, Crimson Globe.

CABBAGE—Early Wakefield, Danish Ballhead.

CARROTS—Early Scarlet Horn, Danvers half-long.

LETTUCE—Hanson Improved, Salamander, Tennis Ball.

CAULIFLOWER—Snowball.

CELERY—White Plume, Golden Self Blanching.

ONIONS—Yellow Globe (yellow), Red Globe (red), Silver King (white).

SWEET CORN—Golden Bantam, Country Gentleman.

PEAS—Little Marvel, Nons's Excelsior, Daisy. (All dwarf kinds).

CUCUMBER—White Spine.

SQUASH—Crookneck (summer), Hubbard (winter).

TOMATO—Earliana, Dwarf Stone.

TURNIP—Early Milan, White French.

Where the Home Garden is, without a greenhouse or good hot-beds, it is better to buy plants already started of Tomatoes, Egg-plant and Peppers, but a little parsley, thyme, and any of the other herbs fancied for flavoring should always be sown in the Home Garden as they are easily grown if, sown the latter end of April or beginning of May.

Succession Crops.—Remember, that the hardier things such as peas, beets, carrots, spinach, turnips, lettuce, etc., may be sown in early April or before. Onions a little later, whereas corn, beans, etc., should not be sown till May, so that, in allotting space these things must be borne in mind. Also, space should be allowed for sowing lettuce at periods two or three weeks apart so as to have one crop succeed the other.

Keep all the ground working. As soon as a crop of peas, for instance, is off any given piece of ground, sow lettuce, spinach, carrots, or whatever is most desired to take its place, and the same spot may well produce at least two, and sometimes three crops in one season.

In sowing seeds, be sure the soil is in a fairly dry fine, workable condition, not too wet and sticky, as that is the worst possible state for seed sowing. Cover the seeds to a depth of $\frac{1}{2}$ inch to two inches, according to the size of the seed and press the soil firmly on the seeds by laying a board on top and walking on it or some such means.

Cultivation.—Frequent, light stirring of the surface of the soil with the hoe, or some other implement, is the best means of promoting growth and keeping the weeds down.

Insect pests of all kinds must be kept in check and the old adage, "an ounce of prevention is worth a pound of cure," is a good one to bear in mind in all garden matters. In dry weather, water must be applied, if possible, and in watering, give enough to soak well down to the roots, rather than in light doses, as a small quantity is apt to cause baking of the surface, and more harm than good may follow.

Transplanting.—Such plants as celery, lettuce and to a lesser extent, cabbage and cauliflower, are very much benefited by transplanting once or twice before being placed in their final growing quarters. This needs be done carefully however, so as to give as little check as possible to the young plants. Care in this means shading and watering until the plants take root in the new soil.

Flowers in the Home Garden.—No Home Garden would be complete without some flowers to make the garden a pleasanter spot to work in, and the home a more beautiful place to live in.

A row of Sweet Peas either against a wall or fence will give lots of cutting for the house, beside shutting out some more or less unsightly object.

Sweet Williams, Pansies, Poppies, Campanulas (Canterbury Bells), Phlox, Mignonette, Candytuft are a few of the old favorites which should find a place in every Home Garden and the same recommendations of fertility and cultivation are applicable to the flower border as well as the Vegetable Garden.

*For the non-professional gardener.

In every situation, however, though seemingly hopeless, there may be a ray of light. It is not impossible that the cost of nursing one's indigestion may soon become prohibitive. In this case, the sufferers will have to give up all of the rapidly accumulating cures, and be forced to go along just as if they didn't have anything the matter with them. They will forget themselves, and thus recover. Providence, after all, is not such a bad taskmaster.—*Life*.

Hardy Roses for the Garden

ALEX. CUMMINGS, Jr.

The addition of the more recent Hybrid Tea class has given the rose a new standing as a garden subject. It is not only the flower of June, but we also regard it as a flower to enhance the garden, from early June until frost—an added quality that at once pronounces the Hybrid Tea as the type "par excellent" for general garden culture. We may also consider the majority of its varieties sufficiently well constituted to replace, to a large extent, the older types for any ornamental purpose.

The genus *Rosa* embraces a great many distinct sections or families, yet the true garden or bedding roses susceptible to successful culture in our climate are restricted to a few well-known types, namely, the Tea-Scented Roses in a few of the more sturdy kinds, the Hybrid Tea, the Hybrid Perpetual or Remontant, the dwarf Polyantha, and the newer *Pernetiana* group. The Bourbon, Bengal, Noisette and other less known types are hardly worthy of this distinction, except in a few instances. Some knowledge of the characteristics of these types is essential to the rosarian, particularly when pruning operations are in order, or in the arrangement of the rose garden, the success of which depends so much on the proper disposal of the various classes.

If a June display, only is desired, the Hybrid Remontant type should be drawn from largely, as it is their characteristic to make a prodigious showing at that season, and for this reason they are commended to the owner of the private estate, who is absent during the late Summer and would therefore prefer the early display. A limited number of the varieties will flower more or less during the autumn months, so that by confining the planting list to a careful selection, a creditable showing could be made at that time. In pink varieties, Mrs. John Laing, Paul Neyron, George Arends, Paul's Early Blush, Mrs. R. G. Sharman Crawford, and Anna de Diesbach are about the best in this respect.

The red roses of this type are sadly deficient in late

flowering qualities, the best being Ulrich Brunner and Gloire de Chedane Guinoisseau, varieties distinct in form, although closely related.

Good white roses are limited to a few varieties in any type, but particularly so in the Hybrid Remontant. Frau K. Druschki is easily the best in this section and is, in fact, generally considered the queen of all white roses, regardless of classification.

For June flowering only, we can add a number of excellent kinds to the foregoing. In white and flesh shades, the varieties Clio, Margaret Dickson, Gloire Lyonnaise, and Mabel Morrison are well worthy of a place in the rose garden.

In red roses, General Jacqueminot, known as the Jack Rose for over half a century, is still a favorite, Marie Bauman, Alfred Colomb, Marie Rady, Senateur Vaisse, Jules Margottin, and Hugh Dickson are each good garden varieties. Hugh Dickson stands out prominently among these and should not be omitted from the planting list.

The Pink Remontant roses that flower only in June also include our hardiest garden kinds—Madam G. Luizet, Oakmont, Baronne Prevost, Magna Charta and Baroness Rothschild are varieties that will resist our winter conditions without protection.

To sum up the good qualities of this type—qualities that endear—we cannot

over-estimate the wonderful display which they are capable of producing in the early Summer, the perfect form, substance and clear coloring of the flowers, combined with a constitution that well adapts them for beautifying exposed locations where the more tender roses would have a struggle to exist.

THE HYBRID TEA

For general garden culture, however, the Hybrid Tea type has attained a degree of popularity that no other type can boast of, and this, we may assume, is the logical test of all around superiority. Combining the good



Columbia—A Growing Pink Rose awarded the Gertrude M. Hubbard Gold Medal for the best rose of American origin introduced within the last five years.



Mrs. John Cook—A Fragrant White Rose, Classed as an Exceptional Out-door Grower.

qualities of the parental types—the Hybrid Perpetual and the Tea-Scented principally—it embodies many desirable traits, and although still in its infancy it has produced so many good varieties that it would be difficult to make a selection of the best without slighting some favorite variety.

Occasionally we find a somewhat fickle rose doing unusually well where it finds conditions congenial. Naturally the proud grower maintains that it is one of the finest of all roses and one that is shamefully neglected by rose growers in general, when, as a matter of fact, his nearest neighbor, regardless of experience, cannot get results from it. This is, of course, exceptional, but we find a striking example in the La France Rose—a very beautiful and effective variety where it finds the right conditions, but as a general rule it is a disappointment. The rose that merits general approval must indeed be one of more than ordinary quality. We note a growing tendency on the part of catalog firms to eliminate the mediocre varieties, retaining only the very best rather than present an elaborate list of varieties. For the climate here in the east, the selection is necessarily rigorous. A rose, no matter how fragrant or beautiful in color, is not desirable unless it is vigorous and robust in constitution. It must grow and flower profusely throughout the Summer and withal, resist severe Winter conditions. These are the prime essentials to our ideal garden rose and in this connection we perhaps oppose the ideals of Europe, where a variety establishes its reputation first on the exhibition table. Here it must do so in the garden.

In this Hybrid Tea family, pink seems to be the prevailing color, as we find it in other types. The varieties Caroline Testout and Radiance are perhaps the best for all around garden purposes, yet there are many varieties

which have excellent qualities and are almost equally desirable. Cynthia Forde, Konigen Karola, Jonkheer J. L. Mock, Lady Alice Stanley, Earl of Warwick, Pharisæer, Lady Ursula, Mrs. W. C. Miller, Mellowmere, My Maryland, Lady Ashton and Madam Jules Grolez, are good garden roses, each distinct in some respect.

The red Hybrid Teas are more numerous than we find this color in the Remontant type. The varieties Red Radiance, Laurent Carle, General Superior Arnold Janssen, Edward Mawley, Gruss an Teplitz, Ecarlate, Cardinal, Leslie Holland, Rhea Reid, General MacArthur and Robin Hood, are all desirable.

The white varieties Kaiserin Augusta Victoria, Augustine Guinoisseau, Panama, Mad. Jules Bouche and Double White Killarney are about the best in their color.

Yellow Hybrid Teas, or varieties with yellow as the predominating color are all too scarce. Mrs. Aaron Ward, Madam Ravary, Madam Jennie Guillemot, Madame Charles Lutand, Mrs. A. R. Waddell and Madame Melanie Soupert, are quite desirable. The variety Sunburst, although somewhat shy in blooming, makes up for this in color and form. There are many excellent varieties of intermediate colors or blends ranging from pink to yellow and orange. The best of these perhaps would be Lady Pirrie, Dean Hole, Antoine Rivoire, Dorothy Page Roberts, Betty, Mabel Drew, Madam Leon Pain and Ophelia.

TEA ROSES

Tea roses are more delicate in nature, and while they are noted for their free flowering qualities, they lack constitution and, with a few notable exceptions, are altogether too tender to survive our severe winters. The



Premier—A Bright Rich Pink Rose Which Promises to Become a Garden Favorite.

varieties Pink and White Maman Cochet, Wm. R. Smith, Harry Kirk and Lady Hillingdon are, however, sufficiently hardy, with a little additional winter protection, to thrive in our climate. The Cochet roses which have been famous for many years and Wm. R. Smith, a variety somewhat familiar but more vigorous in growth, are at their best during the Autumn. Lady Hillingdon, a remarkably free growing variety, is one of the best yellow roses and is well worthy of a place in any rose garden.

DWARF POLYANTHA OR BABY RAMBLERS

The last of the more important bedding types brings us to the Baby Rambler or Dwarf Polyantha Roses. Previous to the introduction of the variety Madame Norbert Levavasseur or Baby Rambler, this type was not considered important. Within the last few years, however, the type, on the whole, has greatly improved and we now have varieties that flower so continuously that they are most desirable for various purposes. Each year shows these roses used more extensively for edging and underplanting the larger types. Massed by themselves they will make a showing that is truly wonderful.

Of the older varieties of the true Polyantha type, the most attractive are, no doubt, Eugénie Lamesch and Leonie Lamesch, usually classed as fancy roses. Their colors include various shades of copper, yellow and red. The white varieties Mignonette and Paquerette are each desirable varieties. We might class with these an old variety, but one of exceptional merit, the variety Marie Pavie. The individual flowers are white, occasionally flushed with pink. As a garden rose it has many excellent qualities that are not sufficiently appreciated. It will be found as hardy as any of this class, healthy in growth and profuse and dainty in flowering. The only red or crimson variety previous to the advent of the Baby Rambler itself was Perle des Rouges, a deep, velvety crimson, and this is still classed among the desirable kinds.

Orleans Rose, Jessie and Erna Teschendorff are among the most effective of the older red bedding varieties. Among the pink, the most popular are Aennchen Muller, Ellen Poulson, Mrs. Cutbush and Phyllis.

ROSE PERNETIANA

An entirely new break in bedding roses was obtained with the introduction of the variety Soleil d'Or, the result of crossing the Austrian Briars with Hybrid Teas and roses of similar types. In this section we find colors that are entirely new in the garden rose, ranging from yellow through orange, copper, apricot and nasturtium red. The type, as a whole, requires a different treatment, particularly in pruning, from that of the other bedding roses, to give the best results. The original variety, Soleil d'Or, is undoubtedly our most glorious garden rose when grown to perfection, but is lacking in continuous flowering qualities. Juliet, Gottfried Keller and Viscountess Enfield are similar in habit. Lyon, Arthur R. Goodwin and Rayon d'Or evidently have more Tea Blood in their composition, as they are freer in flowering, although the individual flower is not so well built. Willowmere and Madam Edouard Herriot are distinct and desirable samples of this type.

More recent introductions such as Louise C. Bresleau, Cissie Easlea, Golden Emblem and Raymond show improvement in growth, particularly the latter, which is one of the best of its class, in the garden.

The rose lover is grateful for the addition of this type and its new and wonderful colors, yet it must be admitted that its introduction was a "blessing not unmixed." In all of these hybrids the "Briar" blood is decidedly potent, and as a consequence they drop their foliage between seasons, and are unsightly. If further

breeding will eliminate these "cranky" traits from the type, while retaining the color, it will be an achievement that will serve as a monument to the skill and persistence of the hybridist.

NEW OR COMPARATIVELY NEW ROSES

The Hybrid Tea Section has made some worthy additions to our garden roses in recent years.

Columbia. Sent out as a greenhouse rose does well in the garden, particularly from Autumn until November, producing long stemmed, perfectly formed flowers of fine color; the foliage is always attractive and healthy looking.

Premier. Another greenhouse rose that will prove valuable in the garden. Under trial in the Portland Test Garden, Portland, Oregon, it has made an enviable reputation. The growth is ideal and the color—a bright rose-pink—will establish it among the prominent garden varieties.

Mrs. John Cook. An enormous, flaky petalled variety of good form. Although it occasionally comes tinged with pink, it can be classed among the whites. It is an Ophelia descendant, but much larger, more robust in growth, more prolific in the garden, and very fragrant. This is an exceptional out-door rose.

Mrs. Charles Bell. A Radiance sport with all the good qualities of its parent, but an exquisite salmon-pink in color. Like Radiance and Red Radiance, it is extra good in the garden.

Old Gold. A semi-double rose that may be classed with the Single Roses, and for that reason is at its best in the bud stage. It flowers in sprays of from three to fifteen buds; continues from June until frost and never mildews. The bright, reddish-orange buds combined with the glossy foliage renders it very valuable for cut flower and decorative work.

Few additions of note have been made to the Hybrid Perpetuals, but the white variety "Mlle. Louise Crette"—a seedling from Frau Karl Druschki, is in some respects better than its parent; the growth is more dwarf and compact, and has no tendency to develop into rank blind wood. The flower is larger, more incurved in form and somewhat fragrant.

In Heinrich Munch, we have another seedling from Frau Karl Druschki, with almost identical growing habits. The flowers are a nice rose-pink in color, and of enormous size, even larger than Paul Neyron and not at all coarse.

A few good Baby Ramblers have also appeared; in Yvonne Rabier and the new White Baby Tausendschon we have two white varieties that are much superior to the older kinds in this color. The flowers remain clean and attractive for a long period.

La Marne. A rosy-pink variety with salmon shadings is an immensely improved Baby Tausendschon in growth and in freedom of flowering.

Triomphe Orléannais, is easily the finest in its color—cherry-red—for garden work; having splendid, healthy foliage under all conditions and it flowers persistently.

Edith Cavell, a later addition, is a brilliant scarlet-crimson and the most vivid in this color. The flowers are semi-double and of unusually good texture. It should supersede Erna Teschendorff either as a garden rose or for forcing.

Paul's Scarlet Climber. Vivid scarlet in color, with the ability to withstand hot sun without burning or losing color. The flowers are fairly double, of medium size and are carried in medium sized clusters. An established plant makes a gorgeous showing and remains in good displaying condition longer than any of the other red or crimson climbers.

Dr. Emily Gray. This variety has not been introduced long enough for trial over an extended period, but it promises to be a great rose. It is a splendid yellow in color, but unlike all other yellow varieties it does not fade immediately on opening. The flowers are large, resembling the Hybrid Tea—"Madam Ravary"—and are produced in good clusters making a rich display. Further, it is a rose with remarkable foliage, having glossy leaves of exceptional texture that will attract attention when not in bloom.

A New Type. Imagine a rose with the foliage, robust growth, and constitution of the Japanese *Rugosa*, but with the flower clusters of a red Baby Rambler, and the same persistent blooming tendency. This will about describe "Mrs. F. C. Grootendorst" the result of a cross between a *Rugosa* rose and the Baby Rambler, "Mme. Norbert Levavasseur." It should be regarded as a shrub rose, and as such, shows wonderful possibilities for landscape planting or as a hedge rose. It is never without flowers—quantities of flowers—from late June until November.

The foliage is absolutely disease resisting and consequently always attractive. Certainly there is no flowering shrub that will compare with it from a display standpoint. In addition to being an exceptionally useful rose in itself, this variety suggests further and greater possibilities as the forerunner of a much wanted type. It will, no doubt, be introduced in 1921.

In the April number Mr. Cummings will tell of the planting, cultivation, pruning and winter protection of garden roses.

The Garden Plus Irises

Robert Swan Sturtevant

A HARDY garden where irises have not a place is unusual, but rarely does the gardener seem to take full advantage of their infinite colors, their varying heights and forms, their easy adaptation to environ-

beds prepared merely with a generous admixture of leaf-mold. Here in early April *I. reticulata* shows its deep red-purple, narrow segments, the awl-like leaves just showing above the soil; later there are some of the true pumilas, equally small but making rich drifts of color; then *verna*, a native, its blue tone intensified by the vivid orange splotch at the throat; *cristata*, and its slightly larger form *lacustris*, form great mats of semi-shade, and the fascinating Japanese *I. gracilipes* is established at the foot of an old apple tree. The solid deep green, luxuriant foliage of *I. graminea* reminds me of *verna*'s evergreen leaves, and its curiously attractive deep rose style-branches have a mellow fragrance that recalls "the rich and fruity odor of a freesia." Occasional plants of rare *regio-cyclus* forms have a foot hold and I look forward to the blooming of some of the California natives that have come from the seed bed. None of these with their dainty growth can compete with their more sturdy and showy brethren but few of them fail to intrigue the passer-by.

In the garden we come to the great variety of Bearded Irises. *Pumila* hybrids, vying in early May with the solid mats of the low phlox, make gorgeous edgings; then there are clumps of intermediate varieties in gorgeous

combination with tulips of every hue, and with the late blooming varieties the garden becomes a veritable palette spread with contrasting tones of color. With my interest in irises, few varieties are used in large masses, many in small clumps, and more and more I come to realize

ment. There is a certain impersonal appeal to a broad-spreading sheet of iris color, but a far greater warmth of fascination when one suddenly perceives an iris in a new setting, its character revealed by the close vicinity of water, rock, or contrasting foliage mass. At first my garden was just garden with irises here and there, slowly I developed an increasing appreciation of color relations, then my interest became centered on irises and now they are everywhere and the garden has just grown with many an outlying bed or border. Sometimes there are serried ranks of irises carpeted with chance seedlings of Forget-me-nots and Johnny-jump-ups, their pert little faces lifted toward the towering iris flowers; elsewhere we find iris in miniature, wee things that hold themselves in vain disdain above the creeping thyme; or, still elsewhere, in the lush growth by the pond they rise shoulder high as wildlings. Only in well-shaded areas am I forced to forego an iris in some form.

There is the garden proper, the seed beds, the rock-garden, odds and ends of narrow borders, and a less tame planting by the pond. Perhaps a brief review of each of these may suggest to you some of the possible ways of using iris.

The rock-garden is on a steep southern slope under great larches, a narrow strip, the sub-soil pure gravel and the



A Garden—Plus Irises. With a Promise of Coming Beauties.



The Same Garden a Week Later With the Irises in Their Glory.

that the taller and finer the form and the larger in size the iris, the greater is its beauty standing clear from its neighbors. A few of the lovely self-colored things like *pallida Dalmatica*, *Aurea*, Dawn, or White Knight, I like in big blocks, but the deep claret tones of Caprice, or the red and yellow variegatas I want only as mere contrasting touches. What could be lovelier than two or three swinging stalks of Caterina rising well above the average level, a compact clump of the rich, velvety Monsignor, or a single well-flowered stalk of Isoline, incomparable in color! New combinations are continually cropping up and this last season one plan at least came to perfect maturity.

Against a brown, hewn trellis where the grapes show pale gray green and blush in their spring dress, there are perhaps twelve tall stalks of the velvety bronzed Prosper Laugier, below, a rounded clump of pure White Knight and a crescent-shaped drift of Prestige, its flowers airily held, its color clear yellow with echoes of white and violet. Rarely have I planned with such success, and who that loves gardening does not plan? If space allowed I should have many borders in selected colors, not all-iris borders, but perennial borders with irises for May and June display; there would be claret, soft yellow, and cream, or purples from richest violet to palest lavende, rose toned and flushed pearly tints, or, perhaps, even bold chestnut and yellows softened by warm blends; infinite are the possibilities.

Down by the marshy edge of the pond, the beardless irises thrive; sibericas in cool white with the most fragile of venations in cream and lavender or in deepening tones of blue-lavender, their myriad flowers like butterflies poised in midair so slender are the stalks; lower growing with less grassy leaves, larger flowers and clearer color are the forms of *orientalis* of which White Queen and the almost velvety Emperor stand out pre-eminent. These are more usual garden favorites, but you will find a quite wide range of color among the natives of China, Thibet, or even our own country, for *Wilsoni* is a straw yellow, *pseudacorus* (the big English wildling) a bright yellow, and *chrysographes* the deepest of violet. All these come into bloom with the great pageant of the Bearded Irises and though I speak of them as lovers of moisture, they do as well in a rich, well-cultivated garden. In late June, or early July, come the giant growing spurias, ochroleucas, and Monnieris, strong growing things with stiff wide spreading petals, but narrow ones which in *Guldenstadiana* become mere spidery limbs, and now also come the Japanese which are so well appreciated a part of many a garden.

Before the hardships of Quarantine 37, I had many English, Spanish, and Dutch iris for mid-June show, but now I treasure but a few for they did not take to my light, poorly-nourished soil. They prove the best of all irises for cut-flowers and I only hope that the Horticultural Board will prove a true prophet in foreseeing a time when "Dutch" bulbs can be as well grown in this country as in Holland and gardens may show again the beauty of bulbs by the hundred. Personally my passing acquaintance with the bulbous irises has not been sufficient to give me a knowing appreciation of the varieties by name, but I hope that others will be able to give them individuality.

All this is from mine own garden lore, but I think an actual example is the strongest argument I can put forward for you to become an active member of The American Iris Society. This was organized but a short time ago, January 29th, to be exact, and already over 260 charter members are enrolled and its policy is to bring to all garden lovers an added appreciation of the iris.

There will be trial gardens, exhibitions, local meetings; we plan to establish standards for nomenclature, descriptions, and judging; information is coming to hand for an authentic treatise on culture to be based on the experience of growers in many localities. As a member you will receive each month published notes of interest, and we trust that many will find their investment of \$3 (the annual dues) of real value.

As secretary of The American Iris Society, I shall be glad to answer iris queries through the pages of THE GARDENERS' CHRONICLE and I wish to thank the editor for this opportunity.

A PLEA FOR UNITED ACTION AGAINST QUARANTINE 37

(From Florists' Exchange, Feb. 21.)

The report of the proceedings, published in last week's *Florists' Exchange*, of the hearing before the Federal Horticultural Board relative to the application of Quarantine Bill No. 37 to orchids, has amazed some of your readers and strengthened the suspicion that the motive behind this measure is to a large degree that of a trade protection. They were no less surprised to find such noted orchid growers as Lager, Manda, Roehrs, Baldwin and Carrillo, drawn into a controversy with a man who has not been a resident of the United States for more than six months, and who has not yet had the opportunity to demonstrate his ability as an orchid grower in his new atmosphere, and another whose new methods of growing are still in the state of experimenting, on the possibility of raising orchids in this country, which subject is totally irrelevant to the one issue in which the Federal Horticultural Board should alone be concerned and which is, whether imported orchids are carriers of injurious insect pests or contagious plant diseases?

If *The Exchange* has quoted Dr. Marlatt correctly, he declared he did not believe it would be worth while to discuss the enemies of orchids for the reason that the Agricultural Department has experts on that subject who know what has been found on orchids, and that the fact that some one outside the Department does not believe an insect has any effect on orchids would not be considered, was certainly a most remarkable statement.

Those who have come in contact with the experts, or as they are officially termed "scientists," of the U. S. Department of Agriculture, do not coincide with the apparent belief of Dr. Marlatt that they are infallible and, while no one expects them to be, some of them are far from it. The attitude at times assumed by the chairman of the Federal Board, of which the foregoing is an example, tempts the writer to recount his reminiscences during the past ten years of his observations and experiences with the "scientists" of the government department of which Dr. Marlatt is a unit. It would provide humorous reading, while it might prove embarrassing to some.

An excellent authority has advised that the Federal Horticultural Board is not in a position to give an impartial hearing because it has already reached its decision, and that it is most natural that it should be prejudiced in favor of its own decision. This authority has suggested that a hearing be sought before the Agricultural Committee of the House, at which all facts from both sides might be fully and freely presented, and from which the Agricultural Committee can draw a just conclusion of the merits of this unpopular measure.

The Association which the writer represents has been patiently waiting for one of the older horticultural organizations to take some action, but none seems disposed to take the step. The National Association of Gardeners is now prepared to take the initiative, if it can secure the co-operation and support of those interested, to bring about a modification of this autocratic, and undemocratic, and un-American law.

A new secretary was recently appointed to that office of the Department of Agriculture, a man who did not achieve his success in life merely through academic channels, but who has also had a broad and practical experience in the field of agriculture. If the case was properly presented to Mr. Meredith, before any other action is decided on, with united support of those interested behind it, it is not at all improbable that those affected may obtain some relief.

Let all horticulturists, including professional and amateur gardeners, who recognize the injustice of Quarantine Bill No. 37, co-operate to bring about a modification of this drastic action (we do not seek to have it rescinded entirely because it possesses some good points, when they are not abused) and to secure representation on the Federal Horticultural Board of practical horticulturists.

M. C. EBEL,
Secretary National Association of Gardeners.

Our Perennial Flowers

A. WITTRUP

FLOWERS are the soul of the garden—the grounds may be very attractively arranged with trees, evergreens and shrubs yet without flowers they are what the woods and natural meadows would be without the gay dotting and sprays of color which lend gayety and brilliance in varying succession from Spring until frost or later.

Yet we see many home-grounds well planted with trees and shrubs and with well kept lawns, millions of city homes with a little space in the front of the house and a fairly large backyard with few or no flowers—lacking the life and music of color—the element that draws out the soul of man to join that of Nature, as expressed in legend and poetry from time immemorial.

Why is this? Everybody loves flowers—but many have the idea, dating from the time of carpet bedding and bedding out plants, that more time is needed to give flowers the proper care than they, in the multitudinous attractions of city life, can devote to them. This is a serious mistake—we have the hardy perennial flowers, that once planted in good soil require very little care during the Summer and only a light protection in Winter—and for this little attention they give us year after year beautiful blossoms, color and fragrance.

And why indeed should one not attend to the labors of gardening? Are its rewards less than some activities assumed as recreation? Is not the satisfaction of being a co-worker with Nature in production of some of her choicest characters wonderfully worth while?

One need only to think of the thousands of lovely cottage gardens in the old villages of England, to see how flowers and vines can help transform the simplest house

into a most charming home. But whether the garden be small or large—informal or formal, the best results will be had by using mostly perennial and hardy biennials which are to be found in many of the old gardens. The *Iris*, Peonies, *Digitalis*, *Campanula*, *Diclytra*, *Dianthus*, Shasta Daisies, *Gaillardia*, *Pyrethrum*, *Chrysanthemums*, Violets, Primrose, Lily of the Valley, Forget-me-nots, Phlox, Hollyhock, Larkspur, Columbine—and so one could go on endlessly giving these old names, each one calling up picture after picture of childhood's fairy tales and charming old gardens and homes from the times of our oldest myths, to the dream-land of the future.

And all these are within reach of everyone practically for the asking. Good soil and sunshine and a little care is all they need, and they adapt themselves to any garden scheme, from that of the cottage, to the park and grounds of the palace, and like the true aristocrat make themselves equally well at home with anyone who loves them.

Flowers of the field, of the woodland, the meadow,
Stars of the hillside, or gems of the glade—
Modest in purity; glowing with brightness.
In the rich folds of the rainbow arrayed—
Called into life by the kiss of the sunshine.
How your warm hues scatter gladness and
cheer;
And from your hearts, lo, the perfumes of Eden
Coily diffuse on the scent-laden air.

—Selected.



Courtesy of Swain Nelson & Sons.

A Garden Near Chicago of Perennial Flowers With Attractive Planting of Trees and Shrubs as a Background Setting.

The Month's Work in the Garden

JOHN JOHNSON

THE busy planting season is fast approaching, and it now behooves every gardener to make good at the earliest possible opportunity any arrears of work. In gardening, as in all other practical operations, there is nothing like method. The season's work should be planned with such careful forethought and precision as if strict account of every operation must be given before an assembly of critics. If methods are adopted early in the season with this thought in mind, future perplexities and disappointments which often arise as the result of having too much of one thing and not enough of another, may be reduced to a minimum. Ability to meet every demand made upon the garden is truly the greatest test imposed upon a gardener's practical skill. It is conceded, of course, that occasional failure must inevitably overtake and rupture the most carefully laid plans, yet those who learn to make failure the stepping stone to success reap the most bounteous harvest.

We have already attempted to outline methods of procedure with regard to making hot beds, and the early sowing of vegetable and flower seeds, and all that can now be said in this particular is that some of these sowings should now be repeated in order to maintain succession or to otherwise make good any which have failed entirely. Transplant seedlings from last month's sowings as soon as the plants can be nicely handled and keep them under similar conditions of soil and temperature and shade from bright sunshine for a week or so until the plants recover from the shift, after which gradually inure to more light and ventilation.

Seedlings like Larkspur, *Antirrhinum*, *Phlox Drummondii*, *Pentstemon*, Sweet Pea and *Verbena* in the flowering group, and members of the Cabbage family leeks, onions and lettuce among vegetables, should be given cool treatment. A little assistance at the commencement they must have, but the aim from now on should be to keep them stocky by a gradual process of hardening after pricking off. This does not imply reckless exposure to chill blasts which are to be expected during the month, but merely emphasizes the necessity of giving air freely whenever there may be a fair opportunity.

In this month's sowings include Stock, Aster, *Zinnia*, Balsam and *Impatiens*. The middle of the month will be early enough to start these. Sow thinly so that the young plants may have abundant room, and when pricked off even a little apparent wastefulness of space will be repaid by stout and vigorous stock.

Pleasure grounds. As the weather shows signs of breaking up push forward the work of cleaning shrubberies. The principles of pruning shrubs are generally well understood. The early flowering group almost invariably bloom on wood of previous season's growth, and therefore require little, if any, attention in the matter of pruning now. Any thinning out which might be needed should be done immediately after flowering, or, better still, in Summer when growth is completed. Late Summer or Fall flowering shrubs may be severely pruned now unless further development of growth is sought. Clear away rubbish and burn in a "smother" and use the resultant ash as fertilizer. It is a crime to commit prunings

and the like to flames and allow the very best fertilizing agency to go up in smoke.

As soon as the work can be done, trim the grass edges and loosen the ground between the shrubs with a spading fork. Ornamental climbers may require attention. Train them away from windows and tie in any growths which might have fallen out of position during the Winter. While the average gardener is perhaps alive to the ornamental value of climbers, there is ample room for a more general employment of this class of plants. For screening unsightly objects, covering arbors, trellises, worn-out buildings and trees, and for clothing rough hungry banks they are indispensable. The uses to which this class of plants may be put are just as varied as the habits of the plants themselves, and their judicious employment at once creates an atmosphere of delightful restfulness, and gives to the home environs that suggestion of age so often conspicuous only by its absence in our American gardens. Now is the time to order them and prepare for the planting operation.

Toward the end of the month remove wind screens and other temporary protection afforded choice shrubs, and remove the winter covering from roses, flower beds and herbaceous borders. Prune and tie in rambler roses and commence pruning bush roses as soon as danger of hard frosts is past.

Pansies, *Bellis* and *Myosotis*, if wintered in frames or nursery rows, should be planted in permanent quarters as soon as the ground can be freely worked. Do any needed alteration and planting in the herbaceous border at the earliest opportunity. Apply fertilizer to lawns, scratch the surface, and re-seed if necessary.

Bush Fruits. Gooseberry bushes require annual attention in the matter of pruning, and there is no better time for doing the work than now. Last season's growths will yield most berries. Cut away all superfluous shoots, but cut the points only of those that will be retained. Try to keep the main shoots about six inches apart and the middle of the bush open so that fruit picking may be more conveniently done. Red Currants must be spurred back to within a couple of buds, although a few shoots may be left about eight inches long for extension if need be. Black Currants require entirely different treatment. Merely cut away exhausted branches and encourage basal growths to take their place. Side shoots which are too numerous should be spurred back.

Vegetable Garden. Remove the covering from Spinach, strawberry plants and the asparagus plot as soon as the weather breaks. Sow such kinds as peas, onions, parsley, parsnips and spinach on mellow ground in a sunny position. In the colder districts it will pay to start a number of these in cold frames with a view to later transplanting in the open. Peas may be sown in 4-inch pots, parsley, lettuce and beets in flats. If room is available under sash sow carrots in drills and sprinkle radish seed between the rows. Transplant seedlings from last month's sowings. Lettuce and cauliflower planted in cold frames in a rich compost will turn in a week or two in advance of those planted in the open during next month. String beans may also be sown in frames at this time.

The Gladiolus

KATHRYN BEACH TRACY

*Uprightness—standing for truth like a tower.
Dignity—symbol of honor and power,
Beauty, that blooms in the ultimate flower.*

Could anything be more perfectly descriptive of the *Gladiolus*? Conceded to be the coming garden flower, it is each year in greater demand for gardens and for

veined, beneath which spread a carpet of bluest of blue *Lobelia*.

Blue gardens are sometimes hungry for a touch of other color, which only makes the blue more telling. Pink, white and yellow may always be used to splendid effect and the tall flowers of the *Gladiolus* show to such advantage.

In a border planting, where all the blues of the *Delphiniums* ran riot, *Gladiolus Daybreak*, orchidlike in form and texture came into bloom with the second flowering of the *Delphiniums*, and the blue and the shell pink of *Daybreak* were both finer for the combination.

I know that reds are now generally shut out of the modern gardens, but when we consider the gorgeous sight of flaming swords of *Gladiolus Mrs. Francis King*, or the glowing red of *Crimson Glow*, piercing through masses of *Lilium auratum*, the tribute to the planter's art is enough to warrant a place in every garden.



Crimson Glow—A Glowing Red Flower.

forcing. It stands alone as a super-satisfactory garden asset. A wealth of bloom rewards a minimum of labor and expense, the freedom from insect pests assures success to the amateur and the glory and charm of each flowering spike fully repays all efforts.

Thirty, even twenty years ago, the word *Gladiolus* suggested nothing but the small red *Gladiolus Brenchleyensis*, a variety still used with effect in large plantings, but far outclassed by the modern type of this magnificent flower. Small wonder that having grown it once successfully, the amateur is ever after an enthusiast.

Assuming that the reader knows something of the incomparable beauty of this garden favorite, let us consider a few *Gladiolus* plantings of real charm.

Against a background of the gray-green foliage and fragrant mauve trusses of *Buddleia*, tall spikes of *Gladiolus Loveliness* with glistening white Lily Lehman bloomed above a carpet of purple *Verbena*. In another corner among white lilies, *Gladiolus L'Immaculée*, purest white, with the rich, exotic buff of *Gladiolus Niagara* were friendly associates with deep blue *Salpiglossis*, gold



Rough Torch—Large Creamy White Flower.

Although there is a great demand for large flowered yellows the demand is correspondingly hard to satisfy. *Golden Measure*, magnificent but prohibitive in price, heads the list with *Mongolian*, *Schwaben*, *Yellow Prince*,

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The Month's Work in the Greenhouse

HENRY GIBSON

The early sown seedlings will now demand attention in the way of pricking off, careful watering, and ventilation in order to reduce losses to a minimum. The damping off fungus (*Pythium de Baryanum*) is annually responsible for the loss of a large percentage of seedlings. Nor it is always a dirty, unkempt condition of the houses, that is responsible for the conditions that are favorable to the development of this fungus. In comparatively new houses, thoroughly clean, and painted, we have experienced the ravages of this pest to an alarming degree, in spite of ample ventilation and liberal use of fungicides.

Once the fungus has inhabited the soil, extreme care has to be exercised to keep it under control, since the moist conditions favorable to the growth of the seedlings are especially invigorating to it. It is good practice when preparing soil for the seedlings to use a liberal proportion of leaf mold, and if it is available spent, hot-bed manure, in addition to sand to make it porous. Then as each flat or other receptacle is filled spread half an inch of coarse sand over the top previous to pricking in the seedlings. When the hole is made for the little plant a portion of the sand will fall into it thus affording a more porous medium around the roots, to carry away surplus moisture.

When first transplanted the seedlings will require some shade until they re-establish themselves in their new quarters, and when this has been accomplished, will demand a sunny position near the glass to develop into sturdy, stocky plants. As the sun gains in power they will need more watering, but be on the alert and see that it is not overdone or serious trouble may ensue.

SWEET PEAS FOR OUTDOORS

From present indications of weather conditions outdoors there appears little likelihood of getting into the ground very early to sow the Sweet Pea seeds, and it will help them considerably on the way to get the seed sown in the greenhouse as soon as possible now. By using 5 or 6 seeds to each pot, and thinning out to the best plants later on, one may expect to have fine stock to set out as early in April as the ground can be worked. It won't hurt them much to get caught by late frosts, the tops will kill back, but they will break again from the base and still be weeks ahead of those sown outdoors in April.

SWEET PEAS UNDER GLASS

These subjects now flowering in the greenhouse will be benefitted by a mulch of good soil and well-decayed manure, or pulverized sheep manure whichever of the latter is available. It isn't good practice to plant Sweet Peas in rich soil or feed them much before they start flowering yet once the buds are set, they will flower for a much longer period if well fed, and watered liberally.

SNAPDRAGONS

From now onwards the flowering stock planted out in the benches will more than make up for lost time. Those that have been slow to throw up flowering stems during the Winter will now soon cover themselves with spikes of blooms.

Proper staking is done in order to keep the spikes from

becoming twisted and broken. Another important matter is the removal of the side shoots if one wishes to have first class material for decorations. These side shoots by the way make fine material for the cutting bench if they are free from rust, or other disease. Snapdragons are gross feeders, and soon permeate the soil with a mass of roots in search of available plant food. Plants that have occupied the benches all winter will be benefitted by a good topdressing of loam and manure.

VIOLETS

To those who propagate their own violets the present affords the best opportunity to secure a supply of cuttings. The plants are now making a natural growth, and in good condition if free from spot and other disease. Whether one takes the cuttings and roots them in the propagating bench, or takes the rooted runners, cutting back their tops a little, and plants them closely in sandy soil, matters little. Successes and failures have been experienced from both methods, and it appears to make little difference so long as neither the cuttings or runners are not too old for the purpose.

The flowering plants will now demand some shade on the roof of the house, and all the air possible consistent with the outdoor temperature will greatly prolong the flowering period.

THE EASTER PLANTS

The plants that are being grown for Easter decorations will now demand a little special care from the cultivator. Every gardener likes to have a good showing at this time. Many owners will undoubtedly plan to visit their establishments round the holidays, especially after being barred from the country for so long through the unusually severe winter weather, and it will afford them a greeting of more than passing moment to find a goodly supply of well grown plants.

Anyone who has ever beheld a rambler rose for instance, just chock full of flowers and buds, yet a most unsightly affair because of crippled foliage, due to mildew, is prepared to admit offhand that it does not produce a very happy effect.

The trouble usually happens during the last few weeks. Every care is taken to have them in at the proper time, they are grown on in a fairly warm temperature, up to the time they show color, and then to hold them back, or harden them off they are brought into a cold house or one where a raw March air struck them from the ventilators, or through a door carelessly left open. Mildew is the inevitable result, and one can use all the fungicides available without removing the effects.

The plants are all the better for being hardened off, but do it carefully, look out for the ventilators and doors, and don't subject the plants to a sudden drop in temperature at one time. Do it gradually, in the way you advanced the temperature when you started to force them.

SPIRÆAS

The Spiræas should be showing color about the time these notes appear, and must have all the room neces-

(Continued on page 110)

Natural Effects in Landscape Work

ALBERT MILLARD

CARPETBEDDING is a thing of the past, and rightly so. We have not the trained help to spend enough time in keeping such bedding in first class condition—and certainly a neglected carpet or mosaic-bed is an eyesore. Besides greenhouse running is too costly nowadays to grow the many different plants in quantities required for such plantings. Lately we came back more to the style of natural planting in woodland or in rockgarden, and we can notice in many new and old places the creation of rockgardens—more are laid out in the past few years than ever before.

Rockgardening in its place, small or large, has a most fascinating influence, it is or rather should be the most wonderful artistic work in the most wonderful style of natural landscape work.

A thoughtfully arranged rockgarden is always admired by any professional or amateur gardener, because constantly new flowers appear, something new is creeping, winding over the paths and rocks, and one feels repaid in frequent visits to watch and look for new features. We admire a well trained Privet Hedge, and it answers its purpose well—but it is always the same old Privet hedge—give me the little steps on the rockgarden to climb, it will strengthen my body and rest my soul. I may say that only a friend of Nature, who studied rock-formations and habits of plant life is able to create a successful rockgarden—and select the place for it.

Nature has very often provided a place to build a rockgarden, may be in a lonely, cool, elevated spot under a tree with sloping ground to the level, bordering a lawn or a walk. This would be an ideal location. If the ground is level, then we have to shape it into a hilly appearance, build up with rocks and boulders, make crevices and pockets, shady and sunny spots to suit our plantings. Trees, especially Evergreens, narrow slim growing ones, like Cedars, *Juniperus*, *Tanus*, etc., give us the wanted irregular skyline and a fine color effect, the latter even in Winter. But a bank is also a very well fitted place for a rockgarden arrangement. Imagine a driveway or a walk flanked on both sides with a bank, and this is a suggestion suitable also for smaller places.

Rustic arbors, settees, birds' feeding stands add to the charming effect in such natural surroundings. It is not at all necessary to use only low growing and creeping plants, some varieties of shrubs, or low growing weeping trees—for instance the weeping *Caragana*, the weeping Cherry, weeping *Forsythia*, weeping Mulberry, Japanese Maples—are very desirable. For a larger place the weeping Willow, Pin Oak, Mountain Ash, Table Pine rightly located, are very effective. It is out of question to use any shrub like Lilacs, Mock Orange, Altheas, Hydrangeas or the like, but *Andromeda*, *Azalea calendulacea*, *pontica*, *amoena* *Hinodogiri*, *Kaempferi* (the new hardy salmon colored), *viscosa* (Sweet White Honeysuckle *Azalea*), *arborescens*, are all beautiful planted in clumps.

Clethra alnifolia (Sweet Pepper Bush) in half shady spots, *Comptonia asplenifolia* (Sweet Fern Bush) *Cornus florida* and *stolonifera* (red osier) *Euonymus* varieties, *Ilex verticillata* (Black Alder) with their red berries in Winter, *Pyrus arbutifolius*, and all the *Rhus* varieties as *R. aromatica*, *copallina*, *glabra typhina* and *typhina lacinata*. These *Rhus* varieties should be cut back to the ground every Spring. *Rubus odoratus* (flowering Raspberry) and the grand *Rubus*—delicious with the very large white flowers—*Sambucus pubens*, red-berried, *Crataegus pyracantha* *Lelandi* carrying their

red fruit until after Christmas. *Symphoricarpus racemosus* (Snowberry) delightful to the eye in Fall and Winter and *Hauthorizza apiifolia* a low growing shrub doing fine in shade and sun, also under trees. The fall coloring of the leaves is exceedingly fine.

Water is essential in the rockgarden to cool off the rocks after a hot sunny day and to feed to the plants. If a natural flow of water is at hand, or near by, it should be utilized in leading a stream over the rocks, forming a cascade and ending in an informal pond. Moisture loving plants will grow in the pool or in the border surrounding it. *Caltha palustris* (marsh marigold), *Iris* (several varieties), *Lobelia cardinalis* (the brilliant red flowering), *Typha latifolia* (Cattail) *Sarracenia* varieties, the Cranberry (*Vaccinium macrocarpum*) and the different Water Lilies would enjoy such a damp atmosphere and the moist soil.

Further, the planting of a background, more or less heavy, is a very important factor to be done. Green Spruces or Pines look well, they act at the same time as a windbreak, and the whole scenery is well set in, like a picture in a frame.

I regret to state that I often saw rockgardens made from a pile of boulders, they may rightly be called Rockeries, but the gardener's eye does not approve of these. The main success depends on deep pockets, as I maintained before, twelve inches should be sufficient for the average plantings. Of course there are many plants which would be satisfied with 3 or 4 inches, like *Sedum* and *Semprevivum*. They are extensively used for the paths, to plant around flat, irregular stepping stones. The small velvety *Sedums* are beautiful to plant between and around these stones. Also *Cerastium tomentosum* (white leaved), *Campanula Carpatica* (blue and white), *Dianthus deltoides* (always in flower), *Houstonia carulea* (the Bluets) *Phlox subulata* (Moss Pinks) *Silene alpestris* (Catchfly) the Thyme varieties (all are fragrant and excellent for stone walks).

Vines, hanging and clinging to large rocks, to cover tree trunks, to ramble over slopes, over little bridges or railings are indispensable in our work.

One of the best vines is the new self-supporting *Ampelopsis Lowii*, it has very dainty leaves, dazzling in sunshine, and once established grows quick and upright. *Ampelopsis Veitchi* and *Engelmanni* are only good for a large campus, and too coarse for small gardens. *Ampelopsis Henry*, *Clematis paniculata*, *Celastrus scandens* (Bittersweet), *Rubus hispidus* (Ruinig Blackberry), *Vitis californica* and *cordifolia* (the wild grapes) are of greatest value. I recommend one common vine, but seldom used, *Lysimachia nummularia* (creeping Jenny), to plant frequently in shade or the open, grows everywhere, is a quick grower, covers any space, and does not burn out, also along paths or to cover big boulders, is not surpassed by any other vine. Also *Arctostaphylos Uva-ursi* (Bearberry), a terrible name to remember, but the greatest plant for rocks in a sunny position, and cannot be beaten in sandy, poor soil.

Climbing Roses are permissible to plant in a Rockgarden, but only the single flowering as Wichuriana (white) Iliawatha, and Ruby Queen, a universal favorite. Other Roses for single planting or grouping are the beautiful Lord Penzances, Sweet Briar hybrids, the Austrian Briars, the Scotch Briars and the lately introduced single yellow Hugonis, a real gem. I could not

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Practical Notes on Vegetable Growing

N. BUTTERBACH

THE essentials for success in vegetable growing are: proper irrigation, deep culture, heavy manuring, and seed with good germinating power. When you are provided with these requirements you are well established for a productive vegetable garden. In the cultural notes I describe the treatment in growing which I have found most satisfactory in my territory. Climatic conditions may vary the date of plantings a little. The North may find our planting time to be a little early, while the South will find it late, but the general treatment varies little. Care should be exercised in careful selection of varieties for early and late planting. Such selections can be made by referring to catalogs of responsible seedsmen.

LETTUCE.—For the earliest lettuce sow seed in hotbeds or greenhouse middle of February, transplant in cold frame or light, airy house, and plant outdoors as soon as frost is out of the ground a foot apart. They want very rich soil and sufficient moisture, as the quality of lettuce depends on crispness, and this can only be obtained by quickness of growth. For later crops seed is sown in rows and thinned out a foot apart. For winter lettuce to be protected or in cold frames middle of September is about the best time to sow. The transplanted plants always do better except in warm weather, when it is better the plants remain where sown and thinned out.

CABBAGE.—Seed can be sown in September and transplanted in cold frames when the plants are about five inches high. They ought to be aired freely during Winter and planted in the open as soon as the frost is out of the ground. But where greenhouses are handy it is hardly worth while to go to this trouble. Early Jersey Wakefield is generally used for this purpose. If the seed is sown early in February the plants are ready to be planted the latter part of March or the first part of April. Cabbage demands heavy manuring and in addition a complete fertilizer and a high culture. Cabbage likes new soil.

CELERY.—Celery seed may be sown in open borders in the latter part of March or early part of April. Or for early use in February in greenhouse or frame and transplanted in flats. It is very slow to germinate and moisture is essential for its germination. Celery is naturally hardy and likes cool weather. The young plants must be kept clear of weeds and watered if necessary. If a growth of 7 to 8 inches has been made, the tops ought to be cut back a couple of inches to strengthen the roots and expose the heart of the plant to the sun. If only a small quantity is needed it will pay to transplant from the seed bed to an intermediate bed before planting. The soil can not be made too rich, and a heavy coat of manure should be plowed under before planting, also abundant water should be on hand. July is usually the month for fall and winter celery. The proper distance between rows is 3½ to 4 feet if the plants are lifted for winter storage, otherwise they are planted in double rows from 10 to 12 inches apart with 6 to 8 feet intervals between, so as to have all the soil needed for winter covering. Celery can also be planted in closely set beds, say 6 x 8 inches. With a very rich soil and abundant fertilizer and water supply celery can then be blanched through the dense shade resulting from the rapid growth. Boards are also used with this method. Celery should be constantly cultivated. Loose soil ought to be packed around the spreading leaves to encourage a compact growth. A light furrow thrown up with a plow will bleach dwarf varieties. For late winter varieties the spade and shovel ought to be used for banking. Celery is very hardy, and a little frost won't injure it. Celery that has been lifted from its place of growth is more liable to decay than that with roots undisturbed.

MELONS.—Melons need a fertile, warm soil, with plenty of humus. Hotbed or compost soil is very suitable. It takes 100 days from the day of planting until the time of ripening. Water-melons take 30 to 40 days more. Three to four years old seed set earlier and better than new seed. For early melons seed sown in a hotbed or greenhouse will advance the plants from two to three weeks. They are sown in pots or on pieces of sod and transplanted in the open ground in May. Well rotted manure in the hills is very beneficial. From 7 to 10 seeds are planted in a hill and later thinned out to three plants. The hills ought to be not less than 4 x 6 feet apart. After the plants attain the height of 6 inches they ought to be cut back to two eyes or leaves, and after

the side branches attain 14 to 16 inches they can be reduced to about a foot to encourage branching. After the setting of fruit, the branch is pinched two leaves above the fruit, and continue to pinch in the same way until the fruit is ripe. Pinching will hasten the maturity and also increase the size of fruit.

CUCUMBERS.—Cucumbers need the same treatment as melons, except for the pinching, and four plants in a hill instead of three.

PEAS.—Peas ought to be sown as soon as the ground can be worked in Spring in rows 2½ feet apart for the dwarf varieties and 3 to 4 feet for the taller or bush varieties. They are planted in succession from March to June and for late crop in August.

BEANS.—Beans are treated similar to peas, only they are not as hardy. The first planting is made in May, and a planting every two weeks until September.

CAULIFLOWER.—Cauliflower like rich soil and a great deal of moisture. The soil ought not to be warm, but at least a foot of top soil is required. They need light and sun, but not too strong a sunlight. A place where it will get the morning sun is very well adapted. In dry weather they need to be watered frequently. Manure water will be a great help, in fact there is nothing better. Constant cultivation is necessary to prevent any check during its period of growth. It is a good idea to tie the leaves with a string over the fleshy flower buds to preserve their ivory whiteness. For early planting the seed ought to be sown not later than the middle of February in a hotbed or greenhouse. The young plants must be transplanted in an airy house or cold frame, and planted in the open in April, or as soon as the weather permits it. Cauliflowers which are not ready to cut before frost sets in ought to be trenched in a cold frame and covered with mats, etc., and they will mature properly.

BRUSSELS SPROUTS.—Brussels sprouts are in reality among the best of vegetables. They like a deep mellow ground, and ought to be sown in April or May in the open, in rows where the plants remain. Transplanting tends to make them leggy. The plants should be 2½ feet apart and 18 inches in the row. The ground ought to be manured the previous year. No manure should be plowed under in time of planting. Sandy soil should be avoided and top growth should be discouraged, as a stocky plant is desirable. Sprouts are very hardy, and they can be wintered over with little protection.

EGG PLANTS.—Egg plants are sown in hotbeds or greenhouses in March and transplanted in 3-inch pots. When the pots are filled with roots they are repotted in 5-inch pots. They are planted in open ground when all danger from frost is over. Egg plants won't make much growth until the hottest months of mid-summer. They need a good supply of water to make a quick growth and without interruption. Planting should be 3 x 3 in a rich mellow soil and protected from potato beetle.

TOMATOES.—Tomatoes for early planting may be sown in March under glass, and for later in the open in May. If sown under glass they are treated the same as egg plants and planted in the open ground in May 4 x 4. In the vegetable garden some kind of frame, stake or trellis should be used.

ONIONS.—The best soil for onions is a rich loam. Plowing should be done in the Fall, and a heavy coat of manure should be plowed in. The ground should be well pulverized in the Spring with a disk harrow, and if chicken manure is available a good sprinkling will be beneficial. The seed should be sown in hotbeds or greenhouse the last part of February or first part of March in rows 4 to 5 inches apart and transplanted as soon as they can be handled. They should be planted in the open in April 6 inches apart and 14 to 16 inches between the rows. Constant cultivation is necessary to keep the weeds down and the surface loose. A top dressing of nitrate of soda two weeks after planting will be found very beneficial. Onions can also be sown outdoors in April in rows and thinned out.

BEETS.—Beets need a light and very rich soil to grow tender roots. Sow with a drill an inch deep. The plants ought to be thinned out, for early use 5 inches, and for later 3 inches, as the former will mature more quickly than the latter, and should be continued until the latter part of July. They can be sown as soon as the frost is out of the ground. Swiss chard is a beet and should be cultivated the same as beets.

SPINACH.—Spinach is the easiest cultivated crop. The first sowing should be made as soon as the frost is out of the ground, and later from August until October. August sown crop is fit for winter use when protected, and October sown is for spring use. New Zealand Spinach is a good substitute for real spinach, and can be used all Summer when real spinach can't be had.

Necessary Equipment for Bee Keepers

HENRY W. SANDERS

MOST beginners in Beekeeping are apt to place far too much stress on the exact pattern of the hive that they intend to use, forgetting that much more depends upon the beekeeper than upon the hive, and that this is at best only a tool, depending for its success upon being operated by a skillful workman. Nearly every writer on beekeeping strongly urges the novice to commence his operation with standard equipment and in this the writer most heartily concurs. It should always be borne in mind, however, that the reason for this advice is not that there is any essential superiority

manipulated, and from this invention the history of modern bee-culture may be said to begin.

As will be seen in the picture, the modern hive consists of a series of boxes, without bottom or top, that sit one atop the other, and each contains 8 or 10 of these movable frames hanging in a "rabbet." The photo was taken during the active season when each colony had two or three extra bodies ("supers") for honey-storage.

During the honey-flow the bees, if strong enough, will fill up many of the combs thus provided. It would be perhaps more correct to say that they would build the combs first, but as we use the same combs over and over again, we think naturally of their working in a super of drawn combs, where the bees have nothing to do but deposit the honey and ripen it. Where there are no drawn combs available, we place in the empty frames a thin sheet of beeswax, rolled in such a way as to resemble the natural "midrib" of the honeycomb, and held firmly in place by tight wires. The bees soon transform this into a perfect comb.

Towards the end of the season the first combs will be ready for extracting, and care should be taken to see that the combs are all sealed over before any honey is taken. The nectar when first brought in is thin as water, and until the bees have ripened it to the thickness necessary, by ventilating the hive, it is in danger of souring in the containers. Bees are the best judges of honey, and when they themselves cap it over, it may be assumed that the ripening process is fully completed.



Eight-Frame Langstroth Hives.

in the eight or ten frame Langstroth hive—indeed there are some well-founded arguments against the size of frame used—but rather that the advantages of interchangeability, of having frames of a size that new ones may be bought from stock, and above all of buying and selling bees in these standard hives, are so important as to outweigh any objections against the hives named.

A beekeeper who has a thorough knowledge of his bees, and of the business of honey-production could make money with "any old outfit," so long as it consisted of some form of movable frame hive. On the other hand, the most carefully manufactured apparatus will not prevent the ignorant and careless beekeeper from losing their bees by winter starvation or disease, if they do not receive the needful care.

Until 1850, when Langstroth invented the hive now used almost all over the world, the beehive consisted either of the straw "skep," with which we are familiar in literature and art, or the box or log "gum" (so-called from being frequently a section of gum-tree). Inside these receptacles the bees built their combs, fixing them firmly to the roof. The beekeeper had no chance to examine the inside of the hive, and the method consisted simply in allowing the bees to swarm at will, hiving the swarms in empty hives, and then, at the end of the season killing with sulphur the bees in the heaviest of the hives, to rob them of their winter stores. Langstroth invented a hive in which the combs are built in wooden frames that can be lifted out of the hive and examined, transposed, or otherwise



Interior of Extracting House.

The combs are collected from the hives, the adhering bees brushed off, and the honey placed in a bee-tight box on a wheelbarrow, or some similar conveyor. It is then taken to the "honey-house" of which the interior is shown in the second picture. On the extreme left will be seen a knife and tank. The comb is rested on this tank and the waxen cappings sliced off with the knife. They drop into the tank to drain off their honey and then go to the beeswax melter. The comb thus uncapped is placed in one of the swinging baskets

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The Professional Gardener

M. C. EBEL

THE professional gardener, I fear, is a very much misjudged individual. Only as recently as last Fall Dr. Sidney S. Wilson, vice-president of the Associated Advertising Clubs of the World, in addressing a convention of professional gardeners, confessed that up to the time he had been invited to address the meeting he was totally ignorant of the fact that such a thing existed as a gardening profession; that his definition of a gardener, until he was enlightened, was "One who labored in a garden." He said that he believed that his definition was one universally accepted by the public and that it rested with the gardener to make his profession more widely known.

The gardener who has acquired his knowledge of the different branches of gardening through lifelong practice and study is assuredly entitled to greater consideration than the garden laborer, though he does not always receive it. Instances are not uncommon where the gardener does not receive as much compensation at the present time for his services as does the laborer whom he employs to work under his direction. That "the laborer is worthy of his hire" is a present-day truism as far as it concerns the ordinary laborer, but it is not so with the average professional gardener.

While a liberal salary is something always much desired by one who works for another, receiving adequate remuneration alone for his services does not content the gardener who engages in his vocation, not merely for what he can get out of it, but because he loves it. An occasional expression of appreciation for the efforts he puts forth and the recognition that he is more than a menial means much to the man who has made gardening his life work. It fills him with inspiration and encourages him to produce better than before.

The most serious draw-back to the proper up-keep of a country estate is usually the lack of interest which the owner manifests in the undertakings of his gardener, and the lack of confidence which he bestows on him, while continually criticizing where credit is due. Naturally this must be disconcerting to the conscientious worker and hinders him from giving the best that is in him. It results in depriving the employer of much of the pleasure he should derive from his gardens, and in making the gardener discontented with the position he occupies. A professional gardener is more than a servant though unfortunately he is so regarded by many employers.

Whenever an estate owner finds that his gardener does not meet the requirements the position he fills demand of him, it would be far better for all concerned if instead of tolerating the gardener's inefficiency, he were replaced with one possessing the necessary ability, for the disposed-of gardener, if he has the qualifications to entitle him to the calling of gardener, will find his right place.

That the gardener, in common with those of some of the other professions, has not found the dollar the cheapest thing to acquire, as the workers of the protected industries proclaim it is, but instead is feeling the sting of the high cost of everything, is generally true. His compensation is practically the same as it was before war conditions advanced the wage of labor and the consequent cost of living. Yet he finds he must pay the same price for his baby's shoes as the

eight dollar a day mechanic of the thirty-six working hour week, on a salary which makes it a problem to the gardener how to make both ends meet.

While it is justly claimed that the average gardener does not receive in monetary consideration the equivalent per month that the laborer on the estate receives, ranging from \$3.25 to \$5.00 a day, according to the locality, for eight to nine hours' work, it is also conceded that the gardener has his cottage and other privileges in the nature of products raised on the place, but for these privileges the employer usually acquires the gardener's presence on the place for practically twenty-four hours a day for thirty days of the month. Possibly the gardener has himself to blame for being over-looked in the readjustment of affairs that has brought about an increase in the cost of practically everything. He is, as a rule, inclined to hesitancy, whereas if he were to approach his employer in a business-like manner on matters concerning himself, he could expect treatment in accordance.

I have refrained from referring to the gardener-superintendent in charge of the management of extensive country estates. As he must possess so much knowledge outside of the various phases of horticulture, such as agriculture, construction, and often engineering, besides executive ability, he should also possess the initiative to negotiate with his employer for remuneration according to the value of the service he is called upon to render, without the necessity of another pleading his cause.

Some of the highly esteemed professions have not always borne the high standard they bear today, and they still possess their short-comings. The profession of gardening is striving to elevate its standard and those who have followed its progress during recent years, must agree that it has met with some measure of success.

The future of the profession now confronts a situation, however, that concerns the owner of the country estate, as much as it does the professional gardener. This is the matter of providing the material to replace those to-day engaged in the profession. Europe has in the past supplied the young gardeners who in time grew up to assume the head gardeners' positions. There is probably no other vocation where the response to the call to arms was in proportion to that of the young men engaged in the gardening profession both here and abroad. A large number now rest "In Flanders' fields where poppies grow." Europe can not supply young gardeners to us as in the past, and so it remains with us in this country to attempt to arouse the interest of our young men in the work. There are many young men, both of American and of foreign birth, who, on being graduated from school, do not want to enter the office or shop but would welcome a call to the great out-doors. Others, desiring to take up a profession, find that they cannot do so owing to their lack of resources, but gardening presents an opportunity to engage in a profession and "earn while you learn."

To arouse the interest of these young men a carefully planned campaign is essential: first, to inform the educational sources of the country concerning the opportunity that professional gardening offers young men whose leaning is towards the art; second, to provide places on country estates where young men who

desire to take up the work would be acceptable. Many estates have the facilities, or could readily install them, to house and board the young men. It has been suggested that community houses providing rooms, board, and study quarters, might be established where young gardeners who could not be cared for on the places, could be accommodated.

There are advantages in employing these young men; first, from the point of view of economy, for the salary at which such young men could be secured as apprentices, including their board, would be less than is paid to the laborer; second, a group of clean-cut young chaps with a good school training behind them and interested in their chosen vocation, would present a more pleasing adjunct to the surroundings than a gang of ignorant foreign laborers working in the garden, and they certainly should produce more satisfactory results. It remains with some one to start the movement to interest our young men in gardening as a profession. Who shall it be?

What is most necessary today to develop better and finer American gardens is a greater spirit of co-operation between garden owners and those men who are earnestly endeavoring to place their profession where it properly belongs, as the oldest of all professions, in the front ranks of the sciences and arts. The question that is still unsolved is what would be the most desirable agency to bring about such co-operation. Possibly some member of the Garden Club of America can answer this question.—From *Bulletin of the Garden Club of America*.

THE GLADIOLUS

(Continued from page 101)

Sunrise and Sunset, all beautiful and satisfactory sorts, of varying shades of yellow. But there is a veritable Gold Coast of yellow and buff varieties with the crimson markings on the lower petals, and they are indeed most decorative. There is Golden King and Golden Queen, Golden West, with color of the setting sun, Rough Torch, Willy Wigman and Jean Dieulafoy, all in gold and red, buff and crimson tints.

Yellow Prince with lavender of Jacinthe or Conspicuous, or with the mauve pink of the ever popular America, gives one of the finest blending of colors.

It is perhaps as a cut flower that the beauty of the Gladiolus is revealed in fullest measure. It matters little whether placed in majestic vases above which tower the four-foot spikes, or in Japanese bowl arrangement, where the bloomed-out tips find their happiest expression.

The small flowered type, the Primulinus Hybrids, are now quite as much in demand for cutting, and especially for forcing, as the large flowering varieties. They are not easily described but their beauty may perhaps be most appropriately called opalescent. Exquisite shades of all colors from terra cotta through bronze, copper, orange, rose, pink, apricot, yellow, buff and cream, with now and then a purple or lavender, and back, yes back to a real pure white one, but only one in a thousand. It is absolutely impossible to do them justice in a word picture. Seeing, only, is believing, and then to see is to desire and that not by the bulb but by the thousand. I speak advisedly for I have worked with them so intimately that I know their unequalled beauty and their limitless charm.

As to the growing end of these garden comforts, success nearly always rewards the amateur who plants the Gladiolus, as they grow well in any good garden soil and respond quickly to water or fertilizer, but a word of advice may be permissible.

In the selection of bulbs do not demand from your seedsmen the largest bulbs. Some of the best do not produce large bulbs, while the largest bulb is often not a flower producing bulb. The medium sized bulb is often the cream of the collection. The essential thing is to get a firm bulb of blooming age.

The next important point is the planting, and I wish this might be in capital letters. Gladiolus bulbs must be planted at least five inches deep and six to eight is much better. The bulb you plant dies away and the flower producing bulb grows on top of it and unless planted deep, it grows too near the surface. Deep planting gives the roots anchorage enough to support a strong, tall flower spike, against all wind and weather, and does away with unsightly stakes.

In every Garden of Delight, the Gladiolus should have a place and in every Garden of Utility there should be rows and rows of space given to them, for from these cutting gardens, the glory goes out to the world, to the home, to the church, to the hospitals, in all the dignity and beauty of the ultimate flower.

NATURAL EFFECTS IN LANDSCAPE WORK

(Continued from page 103)

mention here all the names of plants suited for the rock-garden, they are too numerous, but a few extra good ones might be welcome.

Daphne cneorum, evergreen with fragrant pink flowers. *Kalmia angustifolia*, *glauca* and *latifolia* (the Laurels), *Taxus canadensis*, the low creeping Yew, perennial Asters, *Cactus*, hardy varieties, *Callirhoe involucrata*, spreading, *Cimicifuga racemosa*, *Cornus Canadensis*, 6 inches high, *Dicentra crinia* with purplish flowers and beautiful fine cut leaves—*Eupatorium aceratoides* (white Snakeroot), *Euphorbia corollata* (Spurge), *Gentiana Andrewsii*, beautiful blue flowering, *Hemerocallis* varieties, *Hepatica*, *Heuchera sanguinea* (Bellflower), Iris dwarf varieties, native Lilies, *Linum perenne*, blue flowering, *Mertensia virginica*, early purple flowering, *Mitchella repens* (Partridge Berry) grows well under Pine trees, *Myosotis palustris* in damp places, *Platycodon Marisci*, deep violet, *Auricula*, *Erica* (Heather), different species, *Saxifraga*, *Sedum* high and low growing varieties, *Silene alpestris* and *Shasta*, *Spiraea filipendula* fl. pl., beautiful plant, *Tradescantia virginica* (Spiderwort), *Trillium*, fine for mass planting in woody parts, *Tunica saxifraga*, a continuous bloomer, *Veronica incana* (blue flowers and white leaves), *V. repens*, one of the best ground covers, *Viola* varieties and *Yuccas*. The latter are very effective to plant singly or in groups in exposed places.

"He that feels not the beauty and blessedness and peace of the woods and meadows that God hath bedecked with flowers for him even while he is yet a sinner, how shall he learn to enjoy the unfading bloom of the celestial country if he ever become a saint?"

"No, no, sir, he that departeth out of this world without perceiving that it is fair and full of innocent sweetness hath done little honor to the every-day miracles of divine beneficence; and though by mercy he may obtain an entrance to heaven it will be a strange place to him; and though he have studied all that is written in men's books of divinity yet because he hath left the book of Nature unturned he will have much to learn and much to forget. Do you think that to be blind to the beauties of earth prepareth the heart to behold the glories of heaven?"

—Henry Van Dyke.

A Lesson on Seed Sowing and Germination

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

PROPER TIME FOR SOWING

IT has been my experience in the North-Eastern States, that seed of some species can be successfully sown in the open ground some time during the month of March, *especially when the ground intended for the earliest work had been spaded before Winter set in.*

Frost breaks up the soil far better than can be done by any mechanical operation, and a good tilth can thus be easily obtained with very much less labor. The first step in obtaining successful germination is to make the soil a satisfactory medium for the reception of seeds; and in connection with certain things which only mature well under temperate conditions, such as peas and spinach, and from which it is useless to expect much during hot weather, early sowing is imperative. With pre-winter spaded ground one is in a position to take immediate advantage of the earliest moment in March that the soil is in a fit condition for sowing; this fit condition being that frost is out to the depth of a foot, and that one can walk, or use tools upon the soil without any of it adhering. It is always waste of time to work ground for sowing when it is wet and sticky, although we may take certain liberties in this direction with a sandy soil which would ruin a crop were such liberties taken with one of a clayey nature.

When a soil is friable it falls closely into place around the seed, this assists the seed in absorbing moisture quickly, sprouting commences sooner and the whole process of germination is carried on under the best conditions. These conditions are impossible of attainment when the ground is wet and sticky, or when it is hard and lumpy.

THE GERMINATION OF THE SEED

The germination of the seed is not complete until the plantlet born from the seed is in a position to feed itself.

While the entire round of plant life is wonderfully interesting, there is no phase more so than seed germination, unless we class as still more wonderful the fact of a plant transferring its life to its seed; which seed, although to all appearances dead, contains under normal circumstances potentialities equal or even superior to its parent plant. The life in the seed can under certain conditions be easily destroyed, yet under others it is difficult to kill. When *perfectly dry*, seeds are not changed in their vitality by either high (200 F.), or by very low (70 F. below zero) dry temperatures. Practically a seed is a plant in embryo, which embryo is so designed that it will live through conditions which would be fatal to the plant itself. Neither the strongest microscope nor the most delicate chemical analysis have any power in determining whether a given seed possesses any vitality or not.

HOW TO TEST VITALITY OF SEEDS

The vitality of seeds can only be determined by a germination test which can be made in the natural way by sowing in soil, or by means of several artificial methods, such as placing the seed between two pieces of moist flannel in a warm room, or by means of a laboratory seed-tester. If one sends a sample of seed to their State Experimental Station for testing, they will sooner or later receive word that the seed germinated so much per cent. This means that a certain percentage of the seeds were viable inasmuch as the germ they contained had sufficient life to start into growth or sprout. Properly conducted germination tests are carried out under ideal conditions as regards air, moisture and temperature, which will always give a higher percentage of germination than is generally possible when the seed is sown in the ordinary way. Further, in nearly, if not quite, all samples of seeds there are always some in which the embryo, while having sufficient vitality to start into growth by sprouting, is not sufficiently strong to complete the act of germination and to produce a plant. For this reason, and for others which will be apparent as we proceed, we may calculate that a given sample of seed which will under a properly conducted test show eighty per cent. of germination, will not upon the average give more than forty per cent. of complete germination when sown in the soil under the best conditions; if the soil conditions are not the best then the percentage will be still lower.

Obviously the better the entire conditions surrounding the seeds when placed in the ground the greater will be the percentage of plants produced. It is possible for seeds to be sown in the ground without any germination taking place at all. When this happens the blame is generally put upon the seedsman, while the chances are that the seeds which failed to "come up" were perfectly good

and that the reasons for their not doing so should be sought for in other directions.

The embryo in a good seed is in a state which may be likened to deep sleep; its life is, as it were, arrested, suspended. But under the stimulus of certain conditions, it awakes, throws off its coverings, gathers strength from the stored up food within the seed and appears above ground. Moisture, heat and oxygen are the determining causes of germination, which causes are only effective when co-operating together.

After seeds have been fertilized and ripened, they will, according to their kind, retain for a longer or a shorter period the power of germinating, but why this vitality is more enduring in one instance and less so in another, is unknown. Neither the bulk of the seed nor the character of its outside coverings appear to decide the longevity of the embryo, which in the case of some seeds lives for many years while in others it loses its germinating power in a few days or weeks. The differences in time which seeds of various species remain visible are irrespective of the conditions under which seeds are kept; that is to say, it matters not how good these conditions may be, the germ of some seeds will only remain alive for a certain limited period. At the same time, with special precautions and treatment, there is no question that the life of many seeds may be greatly prolonged beyond that which we know at present, although never for centuries as is frequently stated. Cases so reported cannot be taken as evidence of the longevity of seeds.

LONGEVITY OF SEEDS

Numerous statements have been periodically made about the great longevity of seeds which are of little value from lack of sufficient positive proof. Perhaps the most notorious are those concerning seeds from the sarcophagi of Egyptian mummies. It is now generally acknowledged that no adequate proof has been produced of this germination, the reputed success being due to the duplicity of vendors palming off modern seeds as being taken from the sarcophagi.

The average life of seeds, as of plants, varies greatly with different families, genera and species, but there is no relation between the longevity of plants and the viability of the seeds they bear. As a rule the seeds of trees lose their vitality sooner than most of the annual weeds. For instance, unless seeds of the Elm germinate within a few days after they fall from the tree their power of doing so is lost; while seeds of the annual weed known as Charlock will remain in the ground ten or twenty years, and then germinate when brought near enough to the surface to receive a supply of oxygen. In this connection the old saying as regards allowing weeds to seed, that "one year's seeding makes seven years' weeding" is easily understood.

THE CONSTRUCTION OF SEEDS

All seeds contain more or less of food materials wherewith the young plant is nourished before it is capable of obtaining its own food from the soil, but it is not perhaps necessary to detail all the various chemical and biological processes which take place during the act of germination. The chemical changes which take place are similar to those which occur in the digestion of food in the animal stomach, and the starch, fat and proteids in the seed are resolved into soluble forms. The diastase and peptonizing ferments are very active in producing the changes in both germination and digestion; therefore one part of seed germination is in point of fact a digestive process.

As above mentioned, before germination can commence the co-operative action of moisture, heat and oxygen is necessary.

The action of moisture in softening the seed, which when placed in the soil is in an absolutely dry condition, must take place first and seeds must be nearly, or quite, saturated with water and the seed-case soft enough for the sprout to break through, before germination can start.

The unfolding and expansion of the plantlet is largely due to the strong absorptive power for water possessed by the protoplasm within the cells. When water is obtainable this power causes all parts of the embryo to be constantly full of water, and the elastic cell-walls are distended with water until they are like minute inflated bladders. The pressure thus set up aids in unfolding the different parts from their resting place within the seed-case and enables the plantlet to grow out from the seed. Of course growth by cell division soon takes place, but not until after the original cells are filled with water.

In botanical language, the outer coverings of seeds, which may be one or more, are given names, as pericarp, &c., according to their exact part in the seed's make-up, and the word seed-case can be taken as including all the various terms used in botany to designate the outer coverings of seeds. Seeds differ considerably in the hardness of their coverings, not only as regards different species, but also in respect of seeds of one kind, and some take a very long period before the softening process is complete; further, the nature of the seed-cases of some seeds is such that they do not readily absorb and transmit water at growing temperatures. Some seeds of this character may lie in the ground for weeks, months, or even years without swelling, and plant raisers have adopted various methods to artificially expedite the process, such as stratification in moist sand kept just above freezing point in which the seeds are allowed to remain through the winter months and then sown in the spring; also hot water is used for the purpose.

Sometimes when the outer case is a very hard shell, like that with nuts, the shells have first to be cracked, or the same thing is brought about in nature by the action of frost. While all ordinary garden seeds will, under the usual soil conditions as regards moisture, absorb sufficient water, some require a very much longer period to accomplish this than others, and with these latter, such as parsley and corn-salad, and with others as well, germination can be hastened by soaking the seeds before sowing in warm water the temperature of which should not exceed 100 F. Care should be taken not to soak the seeds too long and they should be taken out of the water as soon as they are swollen and sown immediately. This process should not be started unless the soil conditions and temperatures are right, otherwise the soaking will do more harm than good.

NECESSARY TEMPERATURE FOR SEED GERMINATION

After seeds have absorbed sufficient moisture, the next step in germination is a high enough temperature, and the seeds of some species of plants, and even varieties of the same species will germinate at a lower temperature than will others. It is interesting to note that the absorption of water in no way by itself starts the necessary chemical changes in the seed. These changes do not begin until the embryo commences its activity. Unless the temperature is high enough for this activity to start within a comparatively short period (so far as ordinary garden seeds are concerned) after the seed has become sufficiently moist, the seed generally rots. Therefore the various processes necessary to prepare the food of the plantlet do not begin until after the germ of the seed has started into active life.

It goes almost without saying that it is rare to find a sample of seed containing 100 per cent with living embryos, and it is scarcely necessary to remark that no treatment can put life into a dead seed. Then, too, the embryos vary in their strength, or in the amount of vitality they possess. Some will sprout and then die, while others may not have sufficient strength to push their way out of the ground. These things happen when the surrounding conditions are perfect; when some or all of the conditions are less perfect, then a larger proportion of the viable seeds will fail to complete the act of germination.

As seeds of their kind vary in size, there is a greater amount of total plant food in heavy than in light-weight seeds, and the additional reserve of food in heavy-weight seeds enables the plantlet to reach a more advanced stage of growth before being compelled to collect and assimilate food from the soil. The additional strength of plantlets from heavy seeds prevails more or less, in the case of annuals, throughout their life, and they will invariably come to maturity sooner. The advantages of using seeds which are the heaviest of their kind is obvious, and commercial lettuce growers, for instance, have found that by screening the seeds and using only the heaviest, they are able to produce one more crop during the winter half of the year than they can when unscreened seeds are used.

Sometimes the plantlet exhausts the food contained in the seed before reaching the surface, and of course this is more likely to happen in the case of light seeds than with heavy ones, although if the seed is planted too deeply or the soil conditions are bad, it may occur with the heaviest seeds. If the food in the seed is exhausted before the act of germination is complete, that is, before the shoot of the plantlet has come up above the ground, growth ceases as plants cannot assimilate food until the green substance in the leaves, known as chlorophyll has been formed, because all the organic compounds of plants are produced in the leaf-cells which cannot take place except in daylight, although the electric light does in some degree take its place. It may be argued, in contradistinction to this, that the shoots from bulbs, tubers and other fleshy roots will keep on growing in the dark, this growth, however, takes place by means of the reserve of plant food contained in the bulbs, etc., in which somewhat similar chemical action goes on as is the case in the seed.

None of the chemical, physiological, or biological changes essential to the development of plant food in the soil can take place

in the absence of the stored up energy in the soil indicated by temperature, a statement which applies with equal force to seeds.

There is for most seeds, a certain range of soil temperature under which germination is most rapid: under which the plantlets are the most vigorous, and which ensures the highest percentage of plants from a given quantity of seed. Seeds of different species and sometimes varieties of the same species, have (1) a minimum temperature at which they will germinate at all, (2) an optimum temperature at which germination is quickest, and (3) a maximum temperature beyond which germination does not take place.

Most people know that freezing point (32 F.) is really the degree at which ice thaws and it is no uncommon sight to find grain in the straw of an ice-house germinating between cakes of ice.

We have pointed out the first necessity as being to have the soil in a suitable condition before sowing seeds; which condition will not arrive before the lapse of some days after thawing—sooner in a sandy soil than in a clayey one—during which period the temperature of the soil at the depth of sowing will invariably reach at least 35 degrees. Peas are among those plants having varieties differing in hardness, and while we can sow round seeded kinds. Alaska for instance, any time in March the ground will work properly, it is not safe to sow those varieties having wrinkled seeds so early. Of course we may have bad weather after sowing, but during many years of experience I have never had a failure with Alaska peas although sometimes wet and freezing weather has subsequently followed; the earliest date of sowing has been March 5th. It is sometimes true that peas sown in April will come into use as early as those sown in March, but all other things being equal, the March sown ones invariably give more produce because, although the tops of the March sown ones may have made slow growth, they have used the period in making more growth at their roots and are therefore better able to withstand hot weather in May and early June than those sown in April.

Most people know that the flavor of the wrinkled-seeded varieties is superior to the round ones, but under the same conditions and sown at the same time, the latter are always a week or more earlier. Upon sandy soil especially, it is worth while towards the end of March to risk some of the wrinkled kinds as they sometimes go through all right. In the case of Sweet Peas, white seeds will not germinate under such adverse conditions as those of a dark color.

In the case of the wrinkled varieties of edible peas and the white-seeded sweet peas, it appears that it is not the degree of actual cold which affects them, but when harm is caused it is invariably due to a more or less prolonged period of cold rain after sowing and before germination, and this is especially noticed upon badly drained and shallow worked soils. After germination has started, very early sown things will withstand adverse conditions of greater magnitude than they can before. When germination starts there is always a slight rise in temperature within the seed, due to heat being produced by the oxidation of some of the starch; in fact this rise in temperature is brought about by exactly the same process as that which produces heat in the bodies of animals.

While we need not trouble about temperature in the early sowing of such things as peas and spinach, so long as soil conditions are favorable, yet, as the season advances and we begin to handle less hardy species, soil temperatures require to have greater consideration, as more vigorous plants are produced when the soil is warmer. Probably the most troublesome vegetable in northern districts is the pole lima bean, and it is becoming a common practice to sow this bean in shallow boxes in a cold frame, and plant them out later on; this is the surest way of handling this vegetable especially on a clay soil and in localities with a short summer. It would be only waste of time to sow lima beans when the soil temperature is as low as 49 degrees, but a start may be made with string beans at that temperature, especially with the black seeded varieties, and bush limas will germinate at a lower temperature than the pole variety. Now and then the less hardy vegetables which have germinated at the end of April or early in May are damaged or killed by a May frost, and this happens more frequently in low-lying districts and upon a wet soil; at the same time it is always worth while to take a little risk on the chance of getting some beans and corn from one's own garden a little earlier than is usual in the locality.

OXYGEN ESSENTIAL FOR SEED GERMINATION

As is the case with all living organisms, the embryo contained in the seed requires oxygen for its development, and without it, even if all other conditions are suitable, germination will not commence. A supply of oxygen in the soil is only assured when the ground has been thoroughly worked and is friable and mellow.

Careful observations along the lines of experimentation have proved, in many ways, that when oxygen is completely excluded from seeds, that are otherwise placed properly for germination, they fail to start. It has been found, too, that even after a

seed has begun to sprout, if the oxygen supply is cut off, the plantlet makes no further progress. A soil in the best condition for germinating seeds and the continual growth of crops to a maximum degree, must permit of the ready entrance of fresh air; in other words it must be thoroughly aerated and constantly ventilated.

But it sometimes happens that after seeds are sown, heavy rains cause the soil to run together and to be beaten down more or less solid, and soon after hot sun may cause the formation of a hard crust upon the surface, a condition which not only cuts off the air supply, but also prevents the shoots from the seeds from readily pushing through. This condition occurs more easily on some soils than others and is most troublesome in those containing much clay and little humus, and which have been only a short time under proper garden treatment. When this condition has been brought about it is advisable to carefully break the surface of the soil over the seed with a fine rake, this should be done as soon as the surface is dry enough to prevent sticking and before it bakes hard.

The necessity for oxygen explains why seeds planted too deeply fail to germinate, and why weed seeds remain so long in the ground and continue to come up every time the soil is turned over. This is one reason why seeds must not be planted too deeply, another reason being that too great a depth of soil for the plantlet to push through may cause the food in the seed to be exhausted before the plantlet reaches the surface, even if the seed has been able to obtain sufficient oxygen. Generally speaking, large seeds may be planted deeper than small ones and one of the main objects in covering seeds with soil is to place them in contact with moisture and as the plantlet must force its way through the soil which covers the seed, the less the depth of this soil—all other things being equal—less energy and shorter time are required for the plantlet to reach the surface. Small seeds, like lettuce, celery and carrot, naturally contain very little food for the plantlets, therefore these plantlets are weak and cannot fully germinate if covered too deeply. With these it is a good plan to merely press them into the soil with a board, and after to just merely cover them with fine sand. It is the usual practice to shade small seeds, that must be sown almost on the surface, in a frame or greenhouse, with newspaper, muslin, or lath screens, care being taken to prevent the plantlets becoming drawn and weak by removing the shading as soon as germination is complete. When seeds are sown in a pot or flat, covering them with a sheet of glass will retain moisture while at the same time allowing the plantlets the necessary light as soon as germination has taken place. Very small seeds sown in this way, such as begonia, petunia and tobacco, should not be covered with soil, but merely pressed down into fine, moist (not wet) sandy loam and covered with glass.

DEPTH AT WHICH SEED IS SOWN

While the depth at which seed is sown is, as a rule, governed by its size, this rule, like all others, is subject to exceptions, which exceptions are connected with the actual method of germination practiced by different seeds. For instance take peas and beans; although the latter are much larger yet they will not germinate fully at so great a depth as will peas. If we take a pea and a bean and soak them in water so that the seed case can be easily removed, and then if we carefully dissect them we shall find that the seeds will readily divide into halves, botanically known as cotyledons, between each half we shall be able to observe the embryo compactly folded up. These cotyledons contain the material for feeding the plantlet until it is capable of obtaining food from the soil. In the case of the pea the cotyledons remain in the soil during germination, and the shoot, or plumule, commences growing upwards and the root, or radicle grows downwards. But in the case of the bean—and the same thing occurs with the pumpkin family as well as others—the cotyledons must reach the surface of the ground before the shoot commences to grow; the growth between the root and the cotyledons being known as the hypocotyl. It obviously follows that considerably more energy is required to push the cotyledons of the bean through the soil than is necessary with the sharp shoot of the pea. While therefore the latter will germinate through a covering of soil as great as six inches, the bean does not readily do so if planted to a greater depth than two or three inches according as to whether the soil is sandy or clayey. If beans are covered with too much soil the plantlet is unable to push its cotyledons to the surface and in which case it perishes. Sometimes in the persistent struggle which the plantlet makes to appear above ground the cotyledons get torn off, which also results in death. When cotyledons of plants appear above the soil in germination they are known as seed-leaves. While in most cases beans will, if the soil is more or less light, germinate through three inches, it is never wise to cover them to a greater depth than two inches in one of a clayey nature.

Referring again to peas, while these will push through a considerable depth of soil yet, in connection with March and early

April sowing, it is better to only cover them to a depth of two inches so that the shoot can get above the surface as soon as possible, as bad weather after sowing appears to have less adverse effect after germination than it does before. At the same time one of the advantages of early sowing is to enable a good depth of roots to be formed before hot weather which depth is secured by deep sowing. We can, however, secure the benefits of both quick completion of germination and deep rooting by making a trench for the reception of peas four or five inches deep, sowing the seeds along the bottom of the trench and covering them with only two inches of soil. After which, as the peas grow, the trench should be gradually filled in. Later on in the season as the warmer soil enables germination to take place more quickly, we may cover peas more quickly to start with.

USE OF FERTILIZERS IN SEED SOWING

Germination is liable to be prevented if seed is sown in contact with compound chemical fertilizers, acid phosphate, or any other inorganic fertilizer containing acid. The chief injury from this cause is inflicted upon the young sprouts just as they leave the seed case; injury to the seed itself before germination has started is not so likely unless the amount of fertilizer it comes into contact with is large. Organic fertilizers, such as sheep manure, pure ground bone, do no harm either to the seed or to the sprouting plantlet. Dissolved bones are liable to inflict injury because they are dissolved by acid.

HOW TO OBSERVE THE GERMINATION OF SEED

It is interesting and instructive in many ways to watch the germination of seeds. This may be done by means of a glass case about a foot long and deep, and six inches wide; provision should be made at the bottom for drainage. Put a layer of one inch of sandy loam at the bottom and then place some large seeds of different kinds around close to the glass so that no soil comes between the seed and the glass. Then add another layer of soil and plant some more seeds, and so on until the case is full within an inch of the top. As the case gets full smaller kinds of seeds can be used. Large seeds like beans, pumpkins, &c., should be placed in varying positions, such as upright and flat. By this means the process of germination and the behavior of the plantlet can be watched through the glass, under the varying conditions of depth of soil, &c. Sometimes the root will emerge from the top of the seed, in which case the extraordinary phenomenon of the root turning a complete semi-circle so as to grow downwards will be observed. This characteristic is one of the facts used to show that plants have brain-power. The case should be placed in a warm room, or greenhouse, and the soil kept moist.

PRINCIPAL POINTS TO REMEMBER

From what has been stated, and the subject has by no means been exhausted, we may adduce the following points, amongst others:

A seed is a living organism and must be dealt with as such from the time it is ripe on its mother plant until it has germinated after sowing.

Ground intended for the reception of seeds should be thoroughly prepared and should be in a friable, crumbly condition at the time of sowing. For early spring work such conditions are best secured by turning up the soil in late autumn.

Preparing the soil for the actual reception of seeds should not be done when it is wet and sticky; special care in this connection is necessary with clay soils.

Seed should not be planted too deeply, otherwise it may not germinate at all or the plantlet may be unable to reach the surface.

While seeds of plants native of temperate zones, like peas, may be sown in the Spring when the temperature of the soil is just above freezing point, provided all other conditions are right, one has to wait until the soil is warm—as well as consider possibilities of future frost—before sowing those of plants from warm climates.

Seeds of the highest quality are always the cheapest, whatever their cost. Bearing in mind also in this connection that plant diseases can be transmitted by seeds.

THE MONTH'S WORK IN THE GREENHOUSE

(Continued from page 102)

sary in order to make perfect plants. Good foliage is necessary in order to give the flowers the proper setting. These plants are always benefitted by being placed in a temperature of 50 degrees as soon as the first flowers begin to open. They need water in abundance, and if they are well spaced and the foliage kept dry it is hardly possible to give them too much at this time.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

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D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.
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A GARDENERS' CONFERENCE IN NEW YORK MARCH 18.

A gardeners' conference under the auspices of the National Association will be held in the Engineering Building, 29 West 29th St., New York City, on Thursday afternoon, March 18, at 2 o'clock, to which all those interested in the profession of gardening are invited. An opportunity will be presented for a general discussion of the work outlined for the association, its policies, and the operation of the Service Bureau. This meeting occurs during the week of the International Flower Show, at which time many out of town members of the profession are expected to visit New York.

An executive meeting of the Trustees and Board of Directors will be held in the same building, Thursday forenoon, March 18.

Paul Hamer, Woodhaven, L. I. 10.00
D. L. Mackintosh, Stillwater, Minn. (additional) 4.00

Total \$912.00

In the February number through typographical error, David F. Roy, Marion, Mass., was reported as contributing \$2 to the publicity fund which should have read \$5.

SUSTAINING MEMBERS

Theodore F. Thieme, Fort Wayne, Ind. (William Warburton, gardener), and Samuel W. Hessberg, Cedar Hill, Albany Co., N. Y. (James MacAlister, gardener) have become sustaining members of the association.

W. N. CRAIG TO ADDRESS THE GARDEN CLUB OF AMERICA.

The Garden Club of America, which is manifesting an interest in the aims of the gardeners' national association, will be addressed by William N. Craig of Brookline, Mass., on "The Professional Gardener, from His Viewpoint," at its meeting in New York City on March 17. Congressman M. L. Davey of Ohio will also address the meeting on Quarantine Bill No. 37. In a recent issue of the *Garden Club Bulletin* there appeared an article by M. C. Ebel on "The Professional Gardener" which is reproduced elsewhere in this issue of the GARDENERS' CHRONICLE.

NEW MEMBERS

The following new members have recently been added to our membership list: John Kuig, Frank E. Ehrler, Mt. Kisco, N. Y.; Peter Siroyan, Oyster Bay, L. I.; George Oller, Hackensack, N. J.; John Meally, New York City; William E. Grindrod, Cold Spring, N. Y.; F. J. Freshwater, Manhasset, L. I.; S. R. De Boer, Denver, Colo.; F. T. G. White, St. James, Winnipeg, Canada; John H. Marx, Stanley Bance, Oyster Bay, L. I.; Carl Bauch, Karl Gronbeck, Great Neck, L. I.; Robert Stewart, Wyncote, Pa.; William Cameron, Morristown, N. J.; Alexander Anderson, Dobbs Ferry, N. Y.; Isaiah Gauley, Natl. Soldiers' Home, Va.; William MacGillivray, Newport, R. I.; Alfred G. Williams, Mt. Kisco, N. Y.; John Thompson, Cranford, N. J.; Ernest Marquardt, Alpine, N. J.; Arthur Kirkham, Brooklyn, N. Y.; Harry Wells, Yonkers, N. Y.; August W. Deckert, Philadelphia, Pa.; Gilbert Carlson, Wayzata, Minn.; Thomas Mayberry, Robert McLaren, T. F. Eastwood, New York City.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received for the Service Bureau Publicity Fund up to February 20th.

Previously acknowledged	\$765.00
Peter Boury, Alexandria, Va.	2.00
Stanley Ballance	2.00
Thomas Mackey, Bellport, L. I.	2.00
John D. Wilson, Greenwich, Conn.	5.00
Alex. Thomson, Bernardsville, N. J.	10.00
Walter Sims, Lake Forest, Ill.	3.00
Primus Drobosch, Chicago, Ill.	5.00
Ernest Grey, Fairmount, W. Va.	10.00
F. L. Balogh, Youngstown, Ohio.	3.00
G. H. Pring, St. Louis, Mo.	5.00
M. J. O'Brien, Mt. Kisco, N. Y.	5.00
H. H. Hundt, Perrysburg, O.	2.00
W. C. Rust, Brookline, Mass.	2.00
James Hamilton, Wickliffe, O.	10.00
Paul Powers, Suffern, N. Y.	3.00
Edwin Forsey, Youngstown, O.	5.00
William E. Milbank, Poughkeepsie, N. Y.	10.00
William Michie, Lake Forest, Ill.	5.00
William J. Whan, Huntington, L. I.	2.00
Roderick W. Rose, Dixmont, Pa.	1.00
John Barron, Harriman, N. Y.	2.00
William N. Craig, Brookline, Mass.	10.00
James Armstrong, Marion, Mass.	3.00
George Mentiely, Dobbs Ferry, N. Y.	4.00
James Lyon, Marion, Mass.	2.00
James Dickson, Southampton, L. I.	2.00
Frederick Schultz, New York City (additional)	3.00
Julius P. Erdman, Homelake, Col.	5.00
George B. Anderson, Southampton, L. I.	3.00
August Harter, Greenwich, Conn.	5.00
James Macdonald, Mt. Kisco, N. Y.	2.00

IS PUBLICITY FOR THE PROFESSION WARRANTED?

Much has been said for and against advertising what the profession of gardening represents, and what a real gardener really is. Some gardeners contend that the profession requires no publicity.

GARDENER-chauffeur, all around reliable man, white, to help part time in laundry and housework; Westchester county; unfurnished cottage provided. Write giving references and specifying salary desired. Box X Z, 302 Sun-Herald.

The foregoing advertisement which appeared in a New York paper on February 29 would indicate that there is much opportunity for an educational campaign to enlighten the public on the distinction between a gardener and a handy man.

A MESSAGE FROM THE NEWPORT BRANCH.

Secretary National Association of Gardeners:

I presume you are wondering what the Newport branch of the N. A. G. is doing, as you have not had any notes for some time. Since we received our copies of the convention report, we have been very earnestly discussing the different subjects under consideration until we could arrive at some point where we could offer some helpful suggestions.

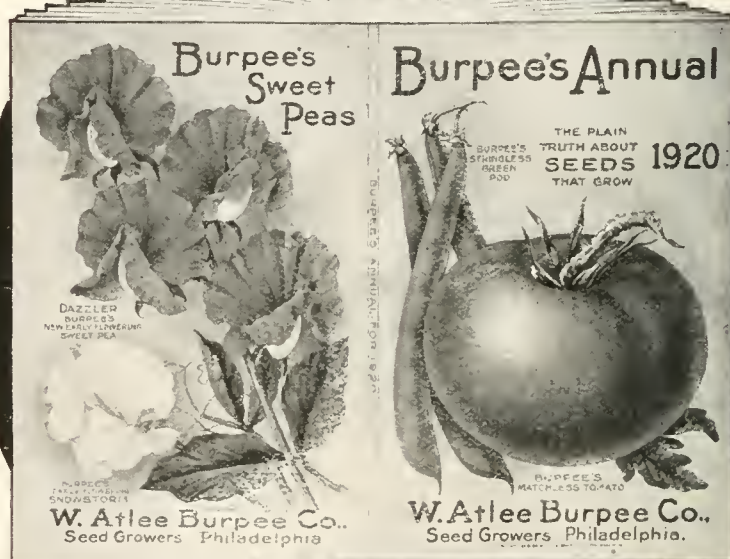
During the Cleveland convention some little discussion took place on the endorsement of local branches. How we came to

form a local branch was through Mr. Smith's article in the CHRONICLE on gardener's certificates. A few interested got together to discuss it, and finally endorsed it. While we were together we thought it would be a good idea to meet once a month and talk over the problems of our association, and try and arouse more interest in it. We still think this is the best way of getting the members to take more interest in the work of the association. We have added several new members and no doubt will gain more. The local branch method is the only remedy for our National Secretary's complaint of lack of interest of the members. We find in our membership roster that there are enough members in different localities to form 36 branches of six members or more, and that is where the members ought to get busy. At these meetings of 36 branches you will get the ideas of some of the best men in the profession, where otherwise they would in all probability never be heard from either through the CHRONICLE or at the conventions, as a large percentage of members cannot attend the conventions. The annual convention is the only meeting of the year open to all members and the next one convenes in St. Louis. How many members from the East where the membership predominates will be able to attend? So to keep up interest it seems the only solution to get all the branches possible, and when any important subject comes up on which the directors would like to learn sentiments of the members, all they would need to do would be to write to each branch and get their opinion which would give the directors a better idea how to act.

On the question of certificates the theory versus practice arises. Judging from the discussion at the convention, theory is of no use to the gardener and certificates one may hold testifying to one's knowledge of the profession are worth nothing as far as ability is concerned. We are of the opinion that in college, theory is largely taught and although theory may not be as applicable to gardeners as to some other professions, it would be absurd to say that we can get along without it when as a matter of fact we are working by theory most of the time whether we realize it or not. We may call it practical knowledge if we will but it was somebody's theory to begin with and only became practical knowledge by inheritance. Perhaps the ability to dissect a flower, to know each part and the functions thereof, is of minor importance to the estate owner but he surely must desire his grounds intelligently planted, and to do that requires not a little of that despised theory. Planted intelligently does not mean making the hole big enough and so on, but rather a study of the position the plants are to occupy, and their colors, habits and textures, etc. It means common sense will usually keep him out of discords but common sense requires to be supplemented by knowledge. This is simply the theory of why certain things are done in certain ways. A good gardener should be a little more than simply a grower and a graduate from the university of hard knocks. Reminiscences of bye gone days are all right, but should not be used to impede progress. Certificates therefore, for practical and theoretical knowledge of gardening would be a great asset to the ambitious man, and would also simplify the work of the Service Bureau and the association's secretary.

We have still one more suggestion to make which is connected with the Service Bureau. Supposing a gardener applied to the Service Bureau for a position. Would it not be well for the secretary to refer to the nearest local branch where the man resides, or the man obtaining endorsement and

Burpee's Seeds Grow



BURPEE'S ANNUAL FOR 1920

The Leading American Seed Catalogue

Burpee's Annual is a complete guide to the Vegetable and Flower garden. It fully describes the Burpee-Quality seeds with a hundred of the finest vegetables and flowers illustrated in the colors of nature. If you are interested in gardening Burpee's Annual will be mailed to you free.

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W. ATLEE BURPEE CO.
Seed Growers Philadelphia

sending in with his application, the man seeking a gardener would be more disposed to engage a man who was endorsed by gardeners of good standing in the neighborhood and would have more confidence in him, and the employer would have more confidence in the Bureau and would advertise it to his friends. It would also relieve some of the responsibility of our secretary.

We have been expecting with each issue of the CHRONICLE since the convention report was given out, some comments of our able writers on the important subjects taken up, but so far have failed to find any. We trust these notes and suggestions will start something.

FREDERICK CARTER, Sec'y.

AMONG THE GARDENERS

William H. Atkinson has secured the position of gardener on the estate of E. H. Inman, Atlanta, Ga.

Malcolm MacAllister secured the position of superintendent of the Mrs. G. E. Kissel estate, Morristown, N. J.

Arthur Chandler accepted the position of gardener on the L. Stern estate, Elberon, N. J.

LOCAL SOCIETIES

PENNSYLVANIA HORTICULTURAL SOCIETY

The third lecture of the present winter's course, was given at the New Century Club, Philadelphia, on February 17. J. Franklin Meehan was the lecturer, his subject being "Landscape Work; With Special Reference to the Suburban Garden."

Mr. Meehan imparted much valuable information to those present. He divided his subject into three parts. First, conception, or conceiving and planning work to be done; second, executive, or carrying out the plans; third, maintenance. The lecturer dwelt at great length on this third part of his subject, and asked "Where are the men to come from in the future, who can take care of the work done by the landscape gardener, after he is through with the operation?" He stated that the gardener of the old school is fast disappearing, and that there are no new men coming along to take his place. By the gardener of the old school, he meant the man in charge of the private estate, capable in all branches of horticulture, who loves his work and loves plants and flowers, and if you visit him and walk around the estate, you stop to admire a specimen tree, he can give you the whole history of that tree and all peculiarities pertaining to it. In a few years, that type of man will not be found. As the laborer in the mechanical trades is receiving more money than the gardener in charge of an estate men are constantly leaving the horticultural profession. The speaker stated it was up to everyone interested in horticulture to talk and write all they possibly could upon this subject, and to do their utmost to place horticulture on a higher plane where it belongs.

The illustrations used by the lecturer showed views of landscape work under way; views of the completed work; and views of the same work three or four years later. Several views of prominent places were shown to illustrate the proper effect of harmony in planting. Quite a number of

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100 Big Shrubs. Immediate effect for marginal border, for screening, or broken masses of shrubbery. Can't fail to please. Deutzia, Forsythia, Syringa, Weigela, Spiraea, etc. 100 big shrubs, 5 to 7 ft. high for \$50.

A ready grown hedge of Hardy Privet—ibota. Fine plants, 4 feet high, bushy, \$38 per hundred running foot. (100) plants. Larger ones if desired. California Privet larger size at same price.

White Lilac Hedge. Makes a charming flowering hedge, especially in cold climates. 4 feet high, \$24 per 100 running feet (1 ft. apart); 2½ foot plants for \$19.

Rugosa Rose Hedge. Good everywhere, but especially near coast. Sweet flowers. Red or white. \$25 for 100 running feet (50 plants, 3 ft. high).

Running Roses. Fine assorted varieties, 3 year, strong roots. Make quick growth. 10 for \$5.

Choice Specimen Stock From Other Blocks

Magnolia Soulangeana Nigra. A rare variety, large, free-growing type, garnet colored flowers. 7 feet specimens. \$10 each.

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specimens. Exceedingly handsome. Red or green, 5 feet high. \$12 each.

Ginkgo Trees. Very fine ones. \$3 and \$5 each.

Black Walnuts and Butternuts. Large, well-grown trees. \$2 each.

Chinese Trumpet Vine. Beautiful buff and orange colored flower. Extra strong, 4 foot vines. \$1.50 each.

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Big specimen plants of Rollinson's Golden Arbor-vitae.

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views were devoted to flowering shrubs showing proper methods of pruning, and improper methods, also of trees.

The exhibit of cut flowers and flowering plants was a very good one indeed.

DAVID RUST, Sec'y.

STAMFORD HORT. SOCIETY

The regular monthly meeting of the Stamford Horticultural Society was held Friday evening, February 20. Seven new members were elected and four nominations for membership received. At the meeting it was decided to incorporate the society, for which attorneys were appointed to draw the necessary papers. The society is about to buy their own Horticultural Hall which is located opposite the High School. The building committee, consisting of Messrs. Geddes, Canon, Cant and others, recommended the buying of this building. President Wild, who advocated for the last years the necessity of it, began a drive at once to obtain funds for this object. Only 40 per cent of the members were present, but when Mr. Wild finished more than \$6,000 was subscribed. The society will issue bonds for every member's share which will bear interest. At the opening of the meeting Mr. Wild spoke in memory of the late James Foster, whose loss will be felt by all. Mr. Doty was elected trustee to take the place of the late James Foster.

A. C. BOON, Corr. Sec'y.

SEWICKLEY (PA.) HORT. SOCIETY

The regular meeting of the above society was held in the Public School on Tuesday evening, February 10. After a lengthy discussion it was voted to hold a Chrysanthemum show early in November. One member suggested that along with such cups or medals as may be offered voluntarily there be awarded ribbons instead of money prizes because of the difficulty experienced in raising the necessary funds.

Fifty dollars was ordered drawn on the treasury and presented along with an illuminated address to John Carman in recognition of his services to the Society during his three years as secretary.

JOHN BARNET, Sec'y pro-tem.

North Shore (Ill.) Horticultural Society

The above society held its regular monthly meeting February 16. Thomas Head initiated the new officers for the coming year. Fred Sparks read a very interesting paper on chrysanthemums, their culture and care. The society decided to rent Anderson's Hall for its future meetings, it being considered more convenient. Tuesday, February 24 was set as the date for the smoking concert. Mr. O'Karl from Lincoln Park was a visitor and complimented the society on its exhibits. Three new members were voted into the society. Charles Elliott, the sweet pea specialist, is offering a challenge trophy for sweet peas to be competed for by the North Shore, Lake Geneva and New Trier Horticultural Societies.

J. R. CLARKE, Cor. Sec'y.

Westchester (N. Y.) and Fairfield (Conn.) Horticultural Society

The regular monthly meeting of the above society was held in Hubbard's Hall, Greenwich, Conn., Friday evening, February 13, with President John Andrews in the chair. Two new members were elected. P. W. Popp gave a lengthy discourse about the coming flower show, to be held in New York City next month, urging the members to bring along some exhibits as it is to be the greatest exhibition that ever was held.



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On the strength of Mr. Popp's remarks a block of tickets was purchased to be distributed among the members. Oscar Ador, in a very stirring address, spoke on the present labor crisis and general conditions prevailing throughout the country. Since our last meeting two of our prominent members have passed over to the Great Beyond in the persons of James Foster and John Harper. Mr. Foster was an expert in all branches of horticulture and a keen exhibitor at our monthly meetings. Though they have passed from our midst both will live long in the memories of those who were fortunate enough to be classed among their friends. Our next meeting will be held on March 12. As some very important business will come up, and as we expect to have a prominent speaker

with us, we hope that all members will try to be present. JACK CONROY, Corr. Sec'y.

THE LARGEST FLOWER

The largest of the flowers of the world is said to be the *Rafflesia*, a native of Sumatra, so called after Sir Stamford Raffles. It is composed of five round petals of a brickish color, each measuring a foot across. The petals surround a cup nearly a foot wide. The cup of the *Rafflesia* is filled with a fleshy disk, the upper surface of which is covered with projections like miniature cow's horns. The cup when free from its contents holds about twelve pints. The flower weighs about fifteen pounds and is very thick, the petals being three-quarters of an inch.—*New York Sun*.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

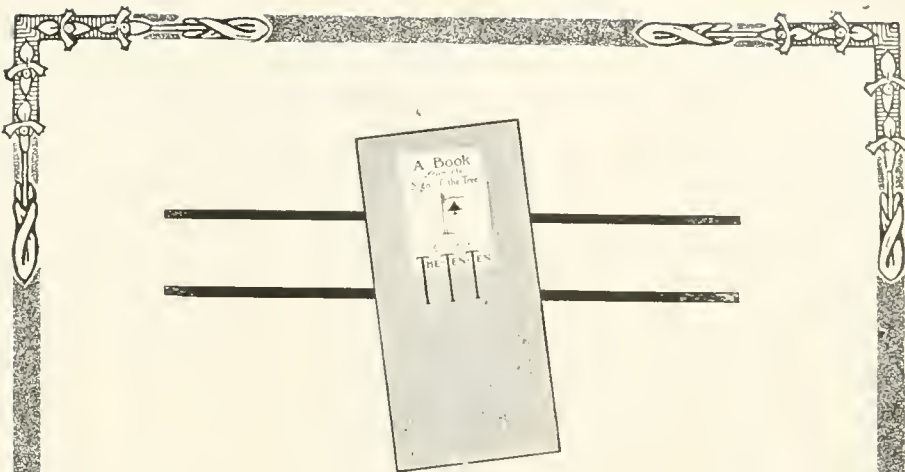
Can you explain what produces the various shades and colorings in our flowers, especially the various tints such as appear in the iris and gladiolus.

H. S., Wisconsin.

It is generally well known that the origin of color in connection with everything on the earth is the sun's rays. These rays contain certain primary colors which are separated and manifested in the rainbow, and which can also be artificially separated by glass. Color, as we see it on flower petals, for instance, results from the play of sunlight upon a surface which rejects or absorbs certain rays. Differences in the color of flowers, or parts of flowers, are caused by their having the power of absorbing certain rays and rejecting others; also they have the power of absorbing or rejecting more of one ray than of another. The great botanist, de Candolle, divided flowers into two classes, which he designated xanthic (ranging from yellow to red) and cyanic (ranging from blue to red). Plants in the xanthic class never have blue flowers (or a color which is termed blue, as pure blue does not exist in flowers), nor do those in the cyanic ever produce yellow ones. Therefore, so far as our present knowledge goes, the production of a blue rose or a yellow aster is an impossibility. While this division of flowers into two main classes is no doubt correct as far as it goes, it has certain limitations which would take up too much space to discuss now.

The power of flowers—within the range of their fixed limitations—to absorb or reject certain color rays depends apparently to a great extent upon climatic conditions. In addition to color rays from the sun, the earth also receives from it actinic (chemical), and thermal (heat) rays, and there appears to be no doubt that the action of all three have considerable influence upon floral colors. Obviously the prevailing condition of the atmosphere in a certain climate has much to do with the prevailing color of flowers native of that region. The intensity and brilliancy of alpine flowers, for example, is no doubt due to the clearness of the atmosphere, allowing color rays to reach them in a state of almost perfect purity. That the thermal rays have some effect upon color appears evident from the fact that in the temperate zones native flowers principally belong to the cyanic series, while those indigenous to the torrid are for the most part xanthic. Of course, flowers belonging to both classes are to be found in the same region, and in this connection neither the xanthic nor the cyanic series can claim the respective yellow and blue in absolute purity, because among flowers, yellow is associated with both these divisions, and a true blue scarcely or ever appears at all.

That atmospheric and climatic conditions do have some effect upon the color of flowers of the same species has been proved. A few years ago some seeds of the Tall Nasturtium produced in Britain were sown near Pretoria, South Africa. It need scarcely be said that the flowers of this plant range from yellow through various orange shades to scarlet. From the resulting plants seeds were saved and in three years the flowers produced were all purple.



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We made it the way it's made, because that's the way we thought you and your friends wanted it.

If we didn't understand you right, then we sure have made a mess of it.

However, those who have seen the advance proofs of it, haven't been slow to declare it was something distinctly new in the seed and nursery field.

Of course, if you want to stick to your old catalogues, just like you do to your old friends; that's just fine. We wouldn't think much of you if you didn't. But you make some very delightful new friends every once in a while, don't you? Those new ones don't make you drop the old ones, do they?

Well, then, why not add a new friend in this new Ten-Ten catalogue?

R. Roehrs

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Seeds of these were taken back to and sown in Britain and from these purple flowers have been continually produced. This shows that the new power of the nasturtium petals to absorb other color rays, which power was acquired under the South African sun in an atmosphere of great clearness, had become fixed in three years.

Some experiments were carried out a few years ago with a view to elucidating the effect of different degrees of sunlight upon floral colors. Flowers were screened artificially in such a way as to prevent the direct rays of the sun falling upon them during certain periods of the day. Without going into details, it may be stated that it

soon became apparent that three colors—yellow, red and purple—were associated with distinct altitudes of the sun as it moved from sunrise to sunset. If a plant was given full sun at a low altitude any power of absorbing yellow it possessed was intensified; while purples could only be produced by the sun at its highest summer altitude, and reds at the intermediate altitudes. The experiments were carried on under the climatic conditions of the north temperate zone. These results have been found to be true in other directions for seasonal as well as diurnal changes in the sun's altitude. Some additional proof may be advanced by the fact that the majority of plants bloom—

ing in the autumn months when the sun is at a lower altitude, produce yellow flowers. While we know with practical certainty the whys of most of the phases of plant life, our knowledge of how color is actually formed in flowers is at present comparatively only in its infancy. It is, however, absolutely certain that all floral colors come from the sun's rays. S.

I have a plot of ground that has been heavily fertilized with chicken manure, which is causing plants to shoot up like weeds. The soil appears to be too rich. What can I do to make it suitable?

W. H. M., New York.

Ground heavily fertilized with chicken manure will naturally be rich, with the natural consequence that plants will make luxuriant growth. The question does not state for what it is desired to make the ground suitable. Most kinds of vegetables would find the conditions thereby produced very suitable, and by intensive and continual cropping the apparent excessive richness would soon be reduced. I have never found the use of chicken manure unsuitable for any crop, but an excessive quantity would doubtless have the effect of, in the case of potatoes for instance, increasing the growth of top at the expense of the tubers, and tomatoes would perhaps be less fruitful. It must be remembered that, while chicken manure is an excellent fertilizer, it is not perfectly balanced, inasmuch as its nitrogen content is too great in proportion to its phosphate content, therefore it is liable when used to excess to produce excessive leaf and stem growth. This can be remedied by the use of bone meal or acid phosphate—the latter is preferable—at the rate of seven or eight hundred pounds to the acre. The richness could be reduced by deeper digging so as to bring up some of the poorer subsoil and mix it up with the surface. This latter must be done with discretion, according as to the kind of subsoil, as too much might do harm; but it is not, however, likely to be harmful if the new soil is thoroughly mixed with the old. S.

In different subjects I read in garden magazines and particularly in the year books of the Dept. of Agriculture about the fixation of the free air nitrogen by the leguminous germs, and in regard to this, it was frequently stated that it was necessary to inoculate such seeds or soil where and when it was intended to improve such land in nitrogen; this being understood when the ground is positively lacking of the proper bacteria, which is noticed by the absence of nodules on the roots of beans or any other legumes.

Permit me to kindly request you, through the questionnaire, to explain the process of inoculating the above-mentioned seeds.

H. S., N. J.

The U. S. Department of Agriculture some years ago gave out a formula for the manufacture of pure cultures of those species of bacteria which cause the root-nodules of leguminous plants, and these cultures can now be obtained through seedsmen. It has been found that different species of leguminous plants have their own special bacteria, and therefore in ordering these cultures the species for which they are required should be stated. There are two methods of inoculation, either by inoculating the seed or the soil. The former is the better way with pure cultures; but soil may be also inoculated by other soil taken from land in which the bacteria are known to be present. As full directions are sent out with the cultures it does not appear necessary to set them forth at



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Announcement

We beg to announce a consolidation, effective January 10, 1920, of Carter's Tested Seeds, Inc., of Boston, Mass., and Toronto, Ontario—the branches of James Carter and Company of London, England, and Messrs. Peterson, Sinclair & Miller, Inc., of New York, who have been acting as sales agents for Carter's products in America.

The headquarters of the enlarged company will be located in New York, and branch offices established in Boston, Chicago, Philadelphia, Toronto and probably other cities.

Fully appreciating the demand for our products in the past and recognizing the added responsibility that an ever growing business must bring with it, we have built our organization accordingly, and can assure our patrons of efficient and satisfactory service.

We will continue to handle a complete line of Carter's Tested Flower and Vegetable Seeds, which for a century have been renowned for their very high quality and pedigree. A special department for this branch of the business will be maintained at Boston.

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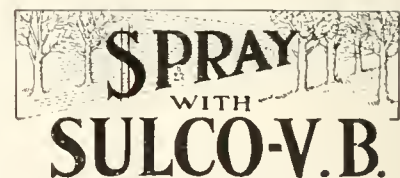
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length, but one very important point may be mentioned: never allow inoculated seed to be exposed to sunlight, therefore when it is sown one man should drop the seed and another follow immediately behind for the purpose of covering it at once. While it is thus perfectly easy to put these bacteria into the soil, it is of little use doing so unless the conditions for the growth and activity are right both for them and for the plants. A non-acid soil, drainage, thorough and deep cultivation, plenty of humus, a supply of lime, phosphates, etc., all these have to be provided, and by the time this has been done the soil has been so greatly improved that inoculation is very often unnecessary. In any case inoculation can do no harm and may do good, but a large increase in the nitro-



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gen content of a soil can to a greater extent be secured by the turning under of leguminous crops. The soil bacteria which are necessary to change soil nitrogen into nitrates (the only form in which nitrogen is available for plants) are not yet obtainable commercially; but one cannot imagine the existence of any soil in which they are entirely absent. More particulars about soil bacteria are to be found in the January issue of this journal.—A. S.

OF GENERAL INTEREST

A UNIQUE EXHIBIT

A most remarkable exhibit, differing from anything usually seen at exhibitions, was found at the "Ideal Home" exhibition, Olympia, London. It was that of a vegetable garden, 1,500 square feet in extent, showing crops in growth as though the season were June instead of February.

The Ministry of Agriculture having designed a method of cropping a garden or allotment which, in their opinion, should produce the maximum amount of food from the land, and having sent plans of such to county councils throughout the country, were anxious that their scheme, showing the summer cropping, should be publicly demonstrated. Consequently, Messrs. Sutton of Reading were asked if they could prepare and lay out such a garden in the short space of five weeks, and this they undertook to do.

"The Ministry of Agriculture (says the *Evening News*) wanted something almost as impossible as strawberries in February; an allotment showing an early summer crop of vegetables, and all in five weeks; but Suttons' accepted the challenge to their efficiency,"—and the result was the model garden as shown. It has been referred to as a "miracle" garden, something more difficult than anything of this kind ever attempted before. How the various plants were got into their present condition of growth in five weeks in the middle of winter, was a mystery to many. The vegetables were all growing luxuriously in the open ground and gave no indication of having made the journey from Reading in motor lorries a short time previously.

Potatoes were earthed up, leeks and celery were in their trenches, peas soon showing bloom, and runner beans starting to climb the sticks. Onions, beets, carrots, parsnips, turnips, marrows, and shallots were all several inches high, whilst rhubarb, spring cabbage, and lettuce ready for gathering.

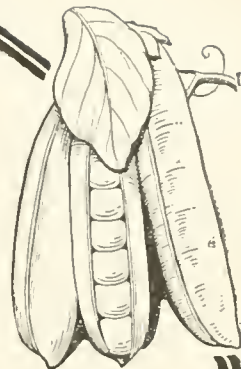
Here and There

CHILDREN'S GARDENS.

Educational theorists have agreed that the value of any mode of education can be very fairly gauged by the extent to which the person to be educated has his intelligence aroused and is induced by interest to take an active co-operation in the scheme, and where shall we get such a response in the way of voluntary activity as is afforded by the provision of gardens for our children? We want the rising generation to be doers as well as thinkers, the recent war has impressed on us more urgently the necessity for this, and half an hour of spontaneous activity is of as much value as an hour spent at organized games or drill. Where a wise interest is

It Pays to Plant the Best

It is easy to plan tasty meals when you have an abundance of crisp fresh vegetables right at hand. Give mother and the girls the benefit of an extra good garden this year. Plant it with "Gregory's Honest Seeds;" they can be relied upon to grow and come true to type. All Gregory Seeds are tested for vitality. Many are special strains perfected on our own seed farms.



Send for FREE Seed Book

You'll enjoy looking over our 1920 Seed Book; it's so straightforward and dependable. Each of its 80 pages contains information of value to gardeners and flower lovers. The Planting Table (p. 59) will help you to order just the right amount of each variety.

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Hammond's Slug Shot
Grandfather used it for potato bugs. Father uses it. Mother uses it on her roses.
This year I am using it in my garden.

"HAMMOND'S SLUG SHOT"

Used from Ocean to Ocean

A light, composite, fine powder, easily distributed either by duster, bellows, or in water by spraying. Thoroughly reliable in killing Currant Worms, Potato Bugs, Cabbage Worms, Lice, Slugs, Sow Bugs, etc., and it is also strongly impregnated with fungicides. Put up in Popular Packages at Popular Prices.

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taken in the children's schemes by a sympathetic elder, gardening may be made a useful means for mental as well as physical culture. Proportion, beauty of design, color schemes, are all points to which the child's attention can fitly be turned, thus helping to develop his artistic sense and establish it on a sure basis; while the seeds can be sown for the desirable qualities of patience and forethought. The lesson that "the best laid schemes of mice and men gang aft agley" is less bitter if learned in childhood, and where has one such ample opportunity for learning the conning as when dealing with plants and flowers in this country of varied seasons and unexpected climatic conditions. In this respect a grain of practice is truly worth an ounce of horrible precept. On the other hand, perseverance many times brings its own reward, and this can be learned at the same time from actual experience on the part of the small worker. Care of tools, methodical ways, and neatness are also seen to bring their own recompense. The child gardener soon realizes this with a very little guidance from its elders.

FOR BETTER GARDENS AND GREENER LAWNS

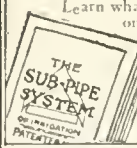
use the "Sub-Pipe" Irrigation System. It will make your garden produce a succession of crops all summer long—keep your lawn and shrubbery fresh and green until frost—when they would otherwise BURN UP from the summer heat.

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feeds water directly on the roots through Redwood "Sub-Pipes" laid a few inches under the ground. Produces abundant vegetation with least expenditure of time, water and money. (Will also drain your land of too much moisture.) Simple, practical, economical; easily installed and operated.

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A child loves to have something of its very own, and so should be encouraged and allowed to work out its own ideas without too much supervision. It will learn most by its mistakes. At the same time, too much must not be expected by the elders, or it will become discouraged, and the gardening a pain instead of a pleasure. Children are instinctively utilitarians in some ways, as is shown by their great desire to help on every possible occasion. Their impulse to perseverance, as well as joy in succeeding, will be considerably helped forward if, by some little well devised scheme, they are made to feel that whatever they produce will be of use and welcomed by somebody.—*Exchange*.

SEED GROWING AT HOME.

Although "there is a general belief . . . that the seed obtained north or south or somewhere away from home is better than home grown seed," many experiments have shown "that in nearly all cases the contrary is true," says Bulletin 216 of the Maryland station. It assumes that this mistaken notion is based on facts that apply to "a few crops like potatoes, cabbage or spinach, that are grown extensively in regions not adapted to their seed production." Viewing the moot question as to whether the individual gardener should attempt to grow or save any of his seed, the bulletin says with dispassionate scientific conservatism, "The conditions that favor the growing of seed elsewhere are: more favorable climatic conditions for some crops, less danger of crossing where grown on a large scale, sometimes freedom from diseases prevalent at home, better trained growers and more economical production where seed growing is the sole interest.—*Garden Magazine*.

WHY SEEDS SOMETIMES FAIL

Of course, bad seeds will not germinate under any treatment. Sometimes, however, good ones fail to do so, even when every convenience exists for their proper treatment. There are several causes for failure, namely, sowing too deeply, not deep enough, a too wet soil and also a too dry one. Now, to be successful, the reader will at once think that the happy medium must be secured in each case. If it is, there will not be many failures; but with a certain amount of moisture we must also have heat. If seeds are sown in a very cold soil at this season, many may perish in it, especially if the soil be very wet. Seeds of the more tender kinds of plants require a warmer temperature than those of hardier kinds. Example: Cucumber seeds would decay in the soil if given similar conditions to those of Broad Beans, but the latter would germinate quickly if treated the same as Cucumber seeds. In very hot weather—in summer time—it is absolutely necessary to give seeds a moister soil than in March. Dust-like seeds—those of Begonias, for example—should be sown on a moist surface where coarse sand is plentiful. Celery seeds should have a quarter of an inch of fine soil evenly scattered on them; Cucumber seeds require nearly an inch of soil; Peas rather more; Broad Beans quite two inches, and so on. The soil must be maintained in an even state of moisture. Many cultivators cover the seed-vessels with glass and paper. If the covering is removed in good time the young seedlings will not be damaged; but if left on too long—even a day in some cases—the seedlings are much weakened and often die afterwards. Never sow thickly, as crowded seedlings are always weakly.—*Exchange*



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Perfect Heating Plant
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HOW TO SAVE SOIL MOISTURE.

If you wish to save moisture, fine the top of your ground. Make it just as fine and loose as possible, and leave it just as level. Ridges and clods in a field waste moisture because they present so much surface to the air.

Also, if you wish to save moisture, get rid of the weeds. Every plant is a veritable pump, drawing water into itself through its roots and giving it out through its leaves. The water that is pumped through your growing corn and beans is utilized by them and helps to make the crop you are looking for. The water that is pumped up by weeds is wasted so far as you are concerned, and your crops are robbed to that extent.

The two essentials of good cultivation, generally speaking, are to keep the weeds down and to keep the top of the soil fine and loose. The former, especially after the cultivated plants get the soft-well filled with roots, is the more important thing to do. Every weed in the cornfield is a pump and is busily pumping possible ears of corn out into the air and scattering them to the winds.—*Seed World*.

WRONG NOTIONS ABOUT FLOWERS

I know people who are deterred from enjoying success in growing certain flowers because of some mistaken prejudice. So many do not care to grow Peonies because they claim the season of bloom is too short, when by judicious selection of varieties they could have a full month of enjoyment with that most exquisitely beautiful flower. Some will not take up Rose culture because somebody who neglected his Roses made a failure of Rose growing. While it is true that no flower can give more disappointment than the Rose if neglected, no flower rewards with greater satisfaction the care and attention it exacts. Some refuse to grow the Gladiolus because the bulbs have to be dug and cared for every Autumn and replaced every Spring; but the enthusiasm this lovely flower inspires makes such work truly a labor of love.

Then we have the prejudice of color. Some people cannot see much beauty in a bouquet of mixed colors, when as a matter of fact, a mixed bouquet is seldom inharmonious, and need not be so at all, if magentas are omitted or used sparingly and white predominates. Some might even exclude *Purple Glory* from their Gladiolus collection and miss its majestic beauty because they do not like a dark red flower. It is well that these prejudices and idiosyncrasies appear contradistinctively as preferences in some natures, as in the old, old story that grandfather used to tell of the Dutchman that ordered his barn

painted, and having been asked by the painter what color he desired it to be, replied, "Well, make it any color so it's red."—*The Flower Grower*.

BEAUTY OF DECIDUOUS TREES IN WINTER

At this time of the year the chief beauty of the deciduous trees is their branching habit and outline as seen against the sky.

To the casual observer only the extremes of form are noted, such as the slender outline and upright growth of the Lombardy Poplar as compared with the spreading growth of the Apple tree. But each kind of tree is different in its method of branching and habit and can readily be distinguished nearly as far as they can be seen.

It is of immense value to know and distinguish mature trees in their winter effect, because this is their condition during at least five months of the year and it is possible to develop much beauty in landscape effects without their summer clothes.

A really successful landscape should be interesting and beautiful at all times, changing from one effect to another as the seasons pass.

The winter beauty of some trees is due to their wonderful symmetry and proportions of the trunk and branches so often seen. It is their own peculiar habit as in the Sassafras and Birch that adds distinction to the landscape. The winter effect of the Black Walnut is not particularly pleasing. It has neither symmetry nor prettiness and is perhaps best described as gawky when seen along side of the graceful lines of the American Elm or Weeping Willow, yet it too has its admirers.

Many who are quite familiar with trees are often confused and unable to distinguish between the Norway and Sugar Maple when in foliage, a little study of their branching habits and outline in the Winter would reveal very conspicuous differences also of the Silver and Red Maple. In fact it is a good time to study trees, their true branching habit is so readily seen.—*National Nurseryman*.

"PANSIES; THAT'S THOUGHTS"

Was it Shakespeare, that real lover of Nature, who spoke of "Pansies; that's thoughts"? In any event my thoughts go back to a day when I practiced law and an elderly maiden lady came in to consult me professionally. There were tears in her eyes, but there was iron in her close shut jaw. Without divulging professional secrets I can tell a little of the story. She had a pansy bed. Her own hand had dug it; and sown the seed; and her heart rejoiced when the little plantlets first showed their tiny stems. So she cared for it, and nourished it, and carefully weeded it; until

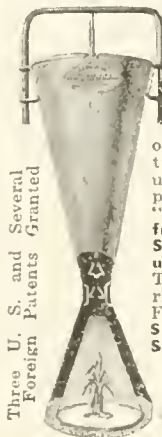
at last the first lovely pansy unfolded its modest monkey face. But now came sorrow and trial into her hitherto placid life. Her niece Emma, maliciously and feloniously and surreptitiously picked and stole and carried away these pansy flowers, the property of, and contrary to the wish and will of her dear maiden aunt. And for that reason the said aunt had come to me to request that process of law might issue against the said niece Emma, to enjoin and restrain and prevent the said Emma from picking, etc., the aforesaid pansy flowers. Now I suppose I could have issued a warrant against the said Emma, etc.; but I didn't. Instead, I explained to the fearful but resentful aunt, that unless pansies were kept well picked off as they came, the plants would soon run to seed, and that there would be no more flowers that season. Were there still pansies, fine, nice ones? Yes. Did she pick any herself? No, not a single bud. Well then, her dear niece had kept the pansy bed from going to seed. And so the good, and no longer tearful aunt left me, without paying me anything for my advice; bent and intent upon thanking her niece for the kindness she had unwittingly done. Now, that is the advantage of a lawyer having a working knowledge of simple floriculture. Otherwise, I might have entered an action on behalf of the tearful aunt and ultimately had the suit ignominiously thrown out of Court, when my learned legal opponent revealed to the somnambulant jury the true situation and circumstances.

H. P. BLANCHARD.

THE FIRST SIGN OF SPRING

What is the first sign of Spring? That would be, indeed, a hard question to answer, for, as Thoreau wrote, "No mortal is alert enough to be at the first dawn of Spring." It cannot be the blossoming of

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the witch-hazel, for while its flowers are abundantly found in the woods in January, they are the last of the season's flowers instead of the first, since the witch-hazel comes into bloom in October and November. It may be the cawing of the crows that through the Winter have been quiet in their wooded retreat; or the honking of the wild geese going north in great trains overhead; or it may be the dripping of the icicles at night, for icicles are the product of late Winter, and their drip, drip, drip, at night is an unmistakable token of over-coming warmth. While the snow still lingers, the catkins of the willows and the birches begin to swell and burst; the chickadees and juncos come out from their winter seclusion in the woods; the song sparrow opens the year's season of song; and the bee and the mourning cloak butterfly appear. The mottled hoods of the skunk-cabbage emerge from the swampy places, and soon Nature's winter tourists begin to arrive, the procession headed by the robin and the bluebird; but which of the two arrives first, must be, as it always has been, a question for argument. In their wake comes that detestable bird with the harsh voice that has been likened to the squeak of a rusty wheelbarrow, the purple grackle, our common city blackbird, who has no friends and, moreover, deserves to have none. By this time signs that are unmistakable are appearing in great profusion, and every department of Nature seems to be scrambling to make its next important announcement. The appearance of the transient fox-sparrow, the purple finch and the Peabody bird; the hepatica, the blood-root and the trailing arbutus; the fiddle-heads of the cinnamon fern; and the peeping chorus of the hylas, are but few of the many signs that Spring is already here, and only needs the appearance of the organ grinder to fully establish the fact.—The Glad Philosopher in *The Flower Grower*.

HOW TO PROTECT THE LOCUST.

Not only because of the beauty and fragrance of their blossoms (which also provide a valuable source of honey for the beekeeper), but especially as a source of strong, long-enduring fence posts, are the members of the locust family to be classed among our really desirable trees. One factor alone has prevented their use in proportion to their usefulness, namely, their almost invariable infestation and early destruction by borers, for which no effective cure had until recently been discovered. For this reason the news, published by the Department of Agriculture, that a very simple method has been discovered for preventing the depredations of these insects, is welcome indeed.

The solution of the problem requires that the trees be planted among other trees, so during the first ten or fifteen years they will grow under densely shaded conditions. It has been ascertained that whereas trees growing from two to three feet apart are seldom attacked by the pests, isolated trees standing only a short distance away are soon riddled and rendered valueless. After about a dozen years the trees are rarely attacked anyway, which makes it possible to do sufficient thinning after that time to insure symmetrical and maximum growth. In the case of an occasional shade tree it is possible to kill the borers while young by means of an arsenical spray applied once or twice a year, but where dense forest conditions can be maintained, as in a wood-lot maintained primarily for fence post and timber production, this method is neither as practical nor as effective as thick planting and the maintenance of a heavy undergrowth.—*Exchange*.



Water Lily Culture Is Extremely Simple

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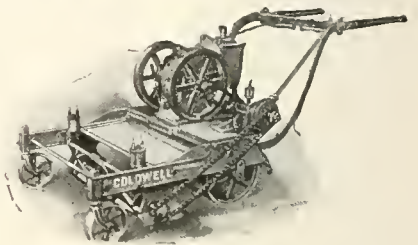
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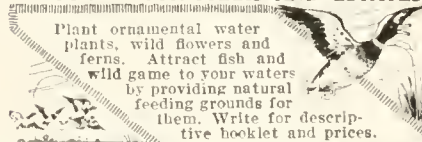
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Necessary Equipment for Bee Keeping

(Continued from page 105)

of the extractor in the center of the picture, and by turning the handle it is rapidly whirled around inside the can. Four combs are done at once and the honey is thrown out by centrifugal force against the inside of the can. It runs down and collects at the bottom, and when enough has accumulated it is drawn off into the pails shown by the faucet. A second tank is to be seen at the left, and the pailful of honey are poured into this, being strained through the rough-mesh cloth shown. Here the honey is left for several days to settle and all bits of wax, air bubbles, etc., rise to the top. The jars are then filled at the faucet shown, labeled, and are then ready for use.

In large commercial apiaries power outfits are used and large tanks into which the honey is pumped, but for the small beekeeper such an equipment as that shown can be provided at moderate cost and will handle a crop of honey running into thousands of pounds.

In the above it is assumed that extracted honey is what is desired, but if the comb-honey we all know is to be produced, then a different set of equipment is needed. The supers are smaller, and are fitted with the little section-boxes in rows for the bees to fill up. In this case, of course, there will be no need for an extractor.

For handling the bees, a smoker and veil are essential. The smoker is an arrangement whereby a small bellows blows air into a tin cylinder into which chips and rags are put and lighted. The result is that one can direct a puff of smoke in any direction required. The veil should be large enough to protect the face and neck and the part in front of the face should have a square of black net inserted, as this is much easier on the eyes.

The catalogues of the supply-makers show an array of many things, some of which, like queen-excluders, and bee-escapes, are useful for certain purposes, but most of which is not used by the practical apiarist.

The few things mentioned above are all that is necessary for success, and more specialized devices may well be left alone till the need for them arises.

In the April number the author will write on "The Bees in Spring."

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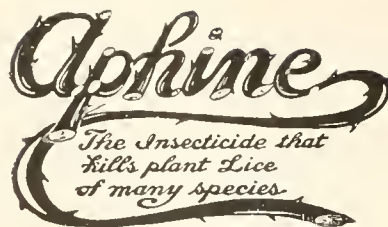
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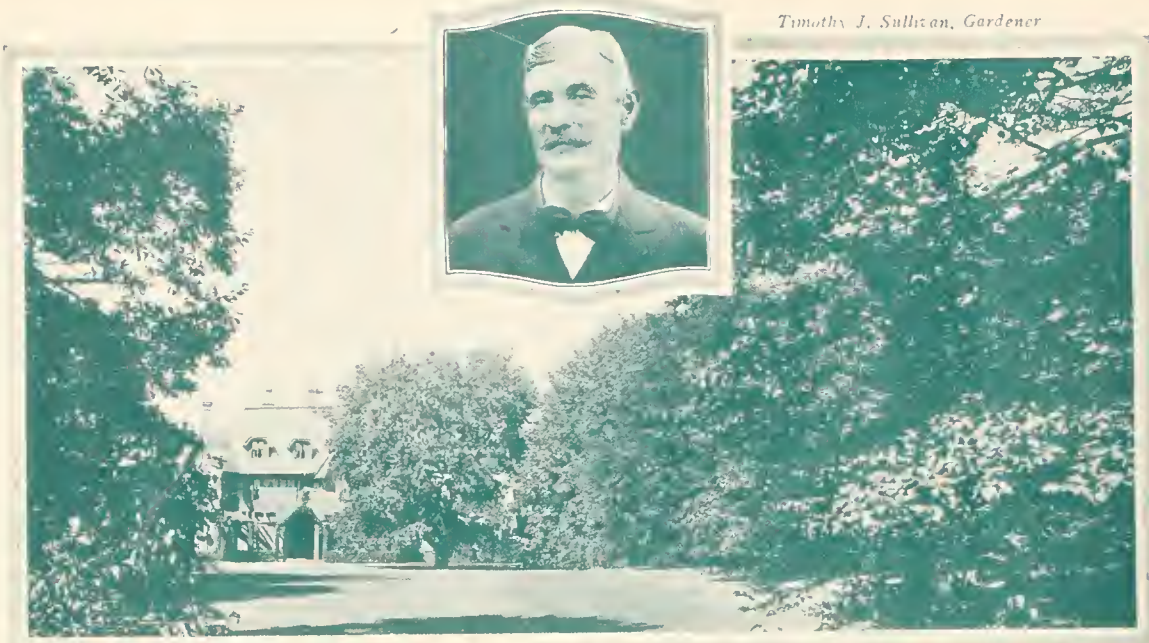
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At the time of writing, Mrs. Webster has again engaged your experts to treat some oaks, beech and maples. You are to be congratulated upon the strides made in few years. I note the improvements on the shaping of the cavities, the value of the watersheds to exclude all moisture, the mechanical bracing and the inserting of cables in place of chains to protect the trees from splitting down at V-shape crotches. I appreciate very much having men of the stamp your experts are, men who know their work, and men who require no watching whatsoever. They are continually on the job, and your foreman is most courteous and obliging.

In 1912 after your experts left here, I swore that Davey would receive my support, and I still insist that DAVEY method is second to none, and a safe bet for a gardener to recommend to his employer.

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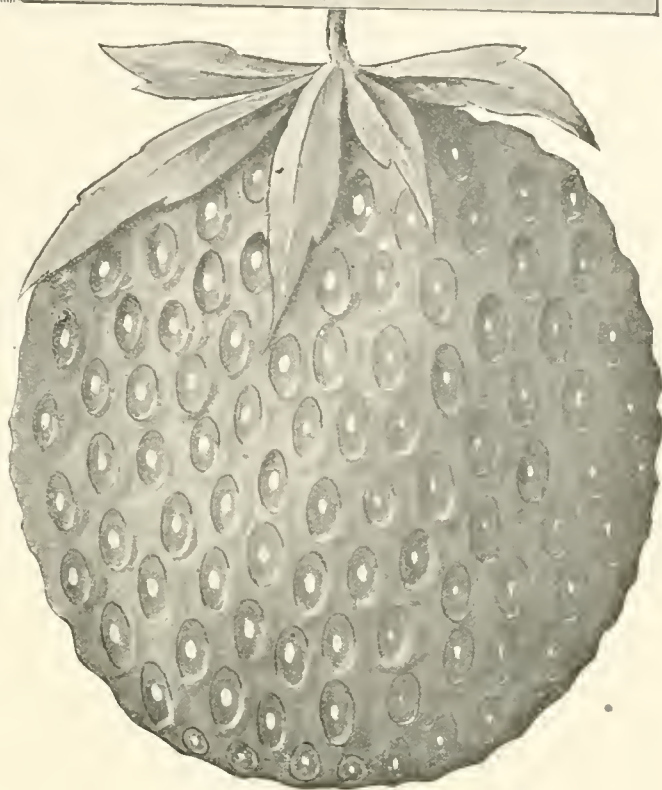
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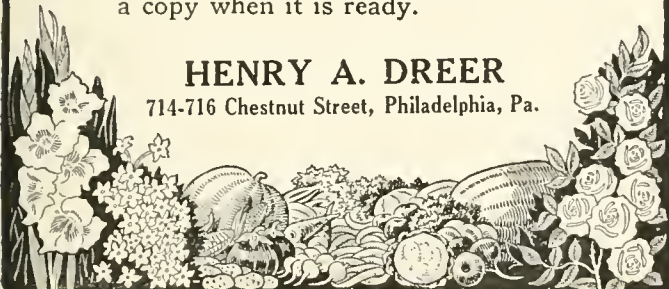
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Vol. XXIV

APRIL, 1920

No. 4

Things and Thoughts of the Garden

THE ONLOOKER

THERE is nothing to equal a flower show in bringing together a notable gathering of flower lovers and garden enthusiasts, and a great number gladly availed themselves of the opportunity to meet and mingle again with the revival of the big floral event in New York after a lapse of two years. It was good to be there, to meet once more acquaintances and friends whom we do not see elsewhere but at the show. Just to wander around and examine the exhibits with kindred spirits is sufficient to renew a strong feeling of hope and inspiration, to be more firmly convinced that the culture and study of plants and flowers is the finest occupation in which we can engage. From a purely materialistic point of view some may be inclined to question this, especially just now in these times of turmoil when there are so many things to vex the spirit of every conscientious gardener. But there is every reason to believe that many of the difficulties by which we are now beset are but of a transitory nature which will gradually disappear as the world recovers its equilibrium. Life is not all sunshine and during cloudy times a pessimistic feeling can be easily aroused. Let us work and look with confidence to the steady progress of the cause of Horticulture and the proper recognition and appreciation of those who make it their life-work.

* * *

Those who are at all familiar with the handling of plants can appreciate the vast amount of hard work which those who put up extensive exhibits are called upon to perform. There is not only the physical labor involved in the transporting, setting up and taking down of the exhibits, but the big features like the rose gardens, bulb gardens, and the large groups of foliage and flowering plants represent a lot of mental work in planning all the details. Then there is the presiding genius of the whole affair, the man responsible for the general layout of the exhibition, a work of no mean undertaking in order to achieve an artistic success. Great credit is due to all those who played a part in this connection, and that their efforts met with general approval was evident from the remarks overheard.

* * *

An important item in any horticultural exhibition is the proper naming of the different plants and flowers exhibited, and in this connection there is still room for a good deal of improvement. Presumably the schedule committees have no wish to establish an arbitrary ruling on the subject, but it is not too much to say that every distinct kind and variety that has a name *ought* to have it plainly written and conspicuously displayed. Some

good people profess to abhor Latin names and to regard the mastery of such as an accomplishment to which they cannot aspire. There is really no harm in being able to distinguish plants by their correct names, neither will such knowledge detract one whit from a grower's ability. Of course the labeling of exhibits entails more work for the exhibitor, but it should be done for the sake of those visitors who not only come to admire, but also to learn what the plants and flowers are which excite their admiration. As an example of first-class labeling, the fine display of Sweet Peas put up by the W. A. Burpee Co. at the New York show is deserving of special mention.

* * *

A very unique decoration at the show and one which attracted considerable attention was that arranged by Max Schling, the well-known florist and decorator, who is usually to the fore with an artistic display on such occasions. In this particular instance the striking feature was the large orange red calices of the Chinese Lantern Plant, *Physalis Franchettii*, which had been split open and fastened to long shrub branches, and the gorgeous effect was still further lengthened by the interspersed sprays of purple foliage. This *Physalis* is well worth growing in the garden for its decorative value in the Autumn and is easily raised from seed. Some catalogs list it as an annual, but I know a garden in Massachusetts where it has proved quite hardy and increased in area during the last five years.

* * *

It was good to see on show again nice flowered plants of *Clivia*, better known to some gardeners perhaps as *Imantophyllum*. This is an evergreen bulbous plant, native of South Africa, a very ornamental plant for conservatory decoration in Spring and well worth while for any one who cares to see the same plant year after year. *C. miniata* is the common species, but there are distinct forms and hybrids which are more attractive when in flower, having brighter and deeper colored flowers than the type. When once established in tubs or large pots the plants seldom need repotting, but it is wise to give an annual top-dressing of good loam, to which has been added a generous dash of bone-meal, soon after flowering. Plenty of moisture is needed during the growing season and if occasionally supplemented with a dose of liquid manure the reward will be forthcoming in due season. Although evergreen, the plants need a season of rest in the Winter time, which is afforded by giving less water and keeping them in a cool temperature. They are quite safe at 40° F. and with the approach of Spring the flower stems push up and from the top unfolds one, two, or three dozen flowers of gorgeous hue.

As bedding plants for outdoor display the Darwin Tulips are well and favorably known, and now within recent years, since the discovery that certain varieties are amenable to forcing, we find them becoming more popular than ever. Market growers are each year giving more attention to them for this purpose, and by careful handling certain kinds are brought into bloom by the end of February, so that the season during which these lovely flowers are obtainable has been very much lengthened. As cut flowers they stand an easy first amongst the Tulips, being ideal for vases with their long stems which bear erect the cup-shaped flowers, the pleasing colors of which are brought out to perfection under glass. When we consider the Tulip as one of the garden flowers whose history runs back through centuries, the Darwin section appears as a comparatively recent introduction, and as a matter of fact less than one third of a century has elapsed since this beautiful type was introduced into commerce by the noted Holland firm of Krelage & Son. Those who can still afford to grow forced bulbs and have not yet tried the Darwins, would surely be well pleased. There is just one important thing to remember, that none will respond to such hard forcing as the early flowering section. March is their month under glass for beginners. Wm. Copeland, Pride of Haarlem, Bartigon, Mme. Krelage, Clara Butt and Farncombe Sanders are good reliable varieties for the purpose and it is sure to be interesting to experiment with others which are not listed as dead sure forcers.

* * *

A plant which never fails to attract favorable notice, especially when seen growing in the open garden, is *Rehmannia angulata*, a comparatively new plant from China, which has been well grown by some gardeners as a greenhouse plant. It makes a showy subject for the Summer garden and in the northern States, at any rate, is best treated as a biennial, although in some years I have had new plants start up from pieces of root which had managed to survive the Winter. From this it will be understood that it can be propagated from root cuttings quite readily, as well as from seeds. Possibly if seeds were sown under glass early in the year, the plants would flower late in the Summer, otherwise it is best perhaps to sow about the same time as Canterbury Bells and winter the plants in a cold frame. The flowers, which might be described as glorified Foxgloves, are borne singly in the axils of leafy stems which may attain to a height of three feet or more. It is a plant which spreads rapidly through the Summer and continues to throw up flowering stems until frost. Ten or a dozen plants grouped together in rich soil will make a very attractive showing.

* * *

A climbing Rose of which I am very fond is *Rosa multiflora*, a Japanese Rose of lasting fame as the parent plant from which many of the beautiful climbing varieties have originated. While somewhat overshadowed, of course, by its more brilliant offspring, it is still worth growing for its own good qualities. It is free growing, the clusters of small white flowers are produced in the utmost profusion, and are followed in due course by an abundance of small bright berries which make it a plant of distinctly ornamental character all through the Winter. It is well worthy of a place in more of our gardens.

* * *

Pergolas of varied descriptions and design are becoming quite familiar features in gardens both great and small. Usually the plants used to clothe them are purely of an ornamental nature, such as Roses, Clematis and others of a similar character. The Grape Vine is some-

times used to provide shade and some fruit, and why not a pergola clothed with choice varieties of Apples and Pears? Trained fruit trees are not at all common with us as in Europe for various reasons. We have not so many garden walls for one thing, and some say they would not be suitable for fruit growing in this climate if we had. But there would seem to be no good reason why a pergola might not sometimes be utilized for training fruit trees on at a great economy of space. The ornamental character would show up well at blossoming time in the Spring and later on be combined with utility at the time of ripening fruit.

* * *

Speaking of fruit trees, there has recently been published a book entitled "Science and Fruit Growing," which should prove to be of more than ordinary interest to fruit growers everywhere, even though it deals with a series of experiments which have been carried on across the water. It is a book which gives the results of painstaking experiments conducted at the Woburn Experimental Fruit Farm for twenty-five years. Those familiar with English garden papers during this time will doubtless recall periodic outbursts of arguments pro and con as the reports of the experiments were published from time to time. It would seem that some of the orthodox teaching would need to be somewhat revised in the light of results obtained at Woburn, but of course it does not necessarily follow that the general adoption of the methods used there would in all cases be as satisfactory. Soil and location are factors which have an important bearing on methods of culture.

One result which is at variance with accepted teaching and practice has to do with the method of planting. This has long been regarded as an operation demanding great care if success is expected, yet the Woburn experiments would seem to indicate that we are over careful. According to these there is no need to take care in spreading the roots at planting, just cram them under and ram them firmly, or rather real hard. It is stated that trees planted in this manner, though slower in starting, eventually outstripped those carefully planted in the ordinary way. It seems to be established beyond doubt that fruit trees are very much more satisfactory when clean cultivation is practiced and that grass growing directly about the trees, especially when they are young, has a very detrimental effect. Experiments in manuring and pruning brought forth interesting results. As regards the latter, which has long been a good subject for argument amongst gardeners, the experiments justify those who contend that newly planted fruit trees should be pruned before starting into growth, that is pruned the first year. Experiments such as these, conducted along sound, scientific and practical lines, are of the greatest value to all cultivators of a studious turn of mind.

The land we live in seems to be strong and active. But how fares the land that lives in us? Are we sure that we are doing all we ought to keep it in vigor and health? Are we keeping its roots well surrounded by the fertile soil of loving allegiance, and are we furnishing them the invigorating moisture of unselfish fidelity? Are we as diligent as we ought to be to protect this precious growth against the poison that must arise from the decay of harmony and honesty and industry and frugality; and are we sufficiently watchful against . . . consuming greed and cankerous cupidity? Our answers to these questions make up the account of our stewardship as keepers of a sacred trust.—GROVER CLEVELAND.

Hardy Roses for the Garden

ALEX. CUMMINGS, Jr.

(Continued from March Number.)

The first important detail in the outside culture of the rose begins in the location of the rose garden. Choose, if possible, a location that is somewhat sheltered from sweeping winds, but not too enclosed to prevent a free atmospheric circulation. A warm, sunny position that will receive the benefit of the morning sun and is sheltered somewhat during the afternoon is the ideal location, yet the rose prefers the full sweep of the elements to the shadows of overhanging trees or nearby buildings.

The rose is not as fastidious in its preference of soils as we are frequently informed. It will give excellent results in any good garden soil that is well drained; that is, soil that is free from standing water. Making a rose bed in a wet situation, no matter how well drained the bed in itself is, can never be a complete success, for no amount of drainage material can amount to little more, in effect, than a catch basin or receptacle for the surrounding water to drain into. The land surrounding the bed must be equally well drained.

In preparing the bed, the soil should be excavated to a depth of eighteen inches or two feet, and refilled with soil, turf, and barn-yard manure in equal quantities, with the addition of a generous sprinkling of coarse bone meal.

The success of the rose bed depends much upon the quality of the plants, to begin with. It is generally conceded that the budded, two-year-old rose is the best for Eastern America. Some more experienced growers prefer to plant dormant stock, while others prefer the established pot plants that are obtained in growth for May planting. Either type is undoubtedly good, the advantage in purchasing plants that are started in pots being in the fact that there is less possibility of loss in planting. Again, it is not always possible to get the ground in shape before it is too late to successfully plant dormant stock in the limited time available. It is important that the soil be in good working condition, not dry, and yet not so wet as to be disagreeable to work with. The plants, if dormant, should be set about two inches below the part where the root and the top unite, or a little lower than previously planted. If the plants are from pots, the ball of earth surrounding the roots should be set two or three inches below the surface level. Part of the soil, only, should be replaced, well firmed and the plant thoroughly watered. When the water is absorbed the remaining soil can be filled in, firmed, and the bed raked level.

The subsequent cultivation and care required merely provides a means of relaxation to the rosarian. The soil should be cultivated lightly at frequent intervals and the plants watered when necessary. A thorough watering is far more beneficial than frequent sprinklings. An occasional application of liquid manure is decidedly beneficial, particularly if applied in a weak solution once or twice a week until the buds commence to show color, when stimulants of any description should be withheld. In early July, a mulch of any strawy material can be applied to conserve moisture and protect the roots during the heat of Mid-Summer.

The majority of our garden roses will come through the average Winter without much protection, if their location is somewhat sheltered, but they are all benefited by a generous Winter covering. A heavy coat of well-dried leaves will afford ample protection to the more hardy roses, but the Hybrid Tea, the Tea, and other less hardy

types require a more careful protection. We find soil to be the best material for protecting tender roses. Where the roses are not too closely planted, the soil immediately surrounding each plant can be drawn up on it to a height of nine to twelve inches. Where the plants are closely placed, the soil should be drawn in from the compost heap or garden. The object in covering roses is not to keep the frost out so much as to keep it in the ground; winter killing is caused more by changeable weather, the alternate freezing and thawing doing more damage than any amount of severe freezing. When the protecting soil is thoroughly frozen, a covering of leaves or litter will keep the plants in good condition until Spring.

The majority of climbing roses are hardy under ordinary conditions, but there are occasions when some protection is desirable. In this event, the growths must be removed from their support and bent not too abruptly to the ground and covered, as far as possible, with soil. Heavy caned plants cannot be altogether protected in this way, without the risk of fracturing the more rigid growths, but they can be bent far enough to permit covering at least two-thirds of the younger wood, and this, of course, is where the protection is required the most. The exposed or arched part can be covered with rye straw and this capped with paper heavy enough to shed the rain.

The additional trouble involved in affording Winter protection is well repaid in the plump and healthy condition of the wood when uncovered.

The most important detail in hardy rose culture—that of pruning—is one that is apt to puzzle the grower not thoroughly familiar with the various types and their habits. The quality and quantity of flowers depend to a great extent on this operation and to the grower not sure of his subject, the best advice, perhaps, would be to let it remain unpruned.

Climbing roses require very little pruning, the removal of the old battle-scarred and dead wood, or any that may appear superfluous, and trimming back the ends of any remaining wood that seems out of balance. This applies to all Ramblers, Wichurianas, Pillar Roses and the hybrid climbing varieties, such as Paul's, Carmine Pillar, Climbing Frau K. Druschki, and roses of that type.

The Hybrid Perpetual or Remontant roses with a few heavy growing exceptions, are benefited by the removal of all weak or dead wood, and pruning the remaining growths back to from three to six eyes, the upper remaining bud should point outwards whenever possible, the purpose of this being to keep the new growth away from the center of the plant.

The pruner's judgment should always be governed by the growth of the plant. If it is heavy and erect in habit, as we find it in the varieties Clio, Margaret Dickson or Gloire Lyonnaise, the pruning should be less severe. Less vigorous kinds of a more branchy lateral growth, Louis Van Houtte, Alfred Colomb, or Fisher Holmes, for instance, should be cut back hard, one or two eyes being sufficient in the lighter wood and not more than four in the heavier wood.

Hybrid Tea and Tea roses require approximately the same treatment. The strong growing kinds can be left a trifle longer, while the weak varieties should be cut practically to the ground to give the best results.

The Dwarf Polyantha and Baby Ramblers merely require a thinning out of the weak or congested center growths, slightly heading the remaining wood back.

Fruit Trees on Walls and Trellises

COMMERCIAL fruit-growing laughs at any shape of trees in America not "near to Nature." In our fruit-favored climate, it is not necessary to train each stem and twig to face the sun, as must be done in the less favored, dull climates of northern Europe, or to keep the trees dwarfed, for he who grows for the markets in this country can find land in plenty for his plantation. But there are thousands of men and women in America who now grow fruit for a pastime. To these pleasure seekers on small places, dwarf trees and trees trained in fanciful shapes on fence or wall make a strong

favorite kinds. A fair measure of success can be obtained with any and all.

Theoretically, however, it is better to work with plants on dwarfing stocks as, apples on the Paradise or Doucin, or the pear on quince; but it is difficult, if not impossible, to get true dwarf trees in America so that the grower must be content with standards. The trees must be given shape in the days of their youth; therefore, buy yearling whips unless the nurseryman has started the training for you. A few nurserymen sell specimen plants, but they are forced to charge fancy prices. In buying, remember that true-to-name variety and good-name-nurseryman go together.

A permanent support is necessary. This may be the side of a barn, garage, or the house itself. Well trained, any fruit will ornament the wall of any building, though one might not choose the front of one's house for even the handsomest trained plant. A garden fence is an excellent support for some of the forms of trained plants. But, more often than not, a trellis of wood or wire must be constructed as a support. This may be of such shape as suits the fancy of the grower, or, more particularly, it should suit the method of training.

In our hot sunny climate, it is seldom that south walls can be used for fruits which blossom early; the peach or apricot, for example, are almost certain to put forth bloom on a south wall only to be nipped by untimely frost. The plum or cherry, or even the apple or pear, may be forced on a south face of a wall. An easterly or westerly face serves best for most fruits.

Whether brick, stone or wood, the wall should be wired. The wires should be kept in place at about two inches from the wall, and should run in lines about ten inches apart. It is much easier to tie branches to these wires than to nail them to the wall; tying saves the wall from injury by constant nailing; the branches form fruit buds all around, which they cannot do when close to the wall; and when fastened to wires the plants offer less shelter to insects.

Trellises or espalier fences should be of the best possible material since they must stand a long time. Iron posts are more durable than wood, although wood is more often used and when kept painted is satisfactory. The trellises are usually from six to nine feet in height,



A Dwarf Pear Tree Trained Fan Shaped

appeal. Trees so trained enable them to have greater numbers of fruits and varieties; finer fruits may be grown on these brought-up-by-hand trees under garden-culture; and, these elaborately-trained plants are good to look upon.

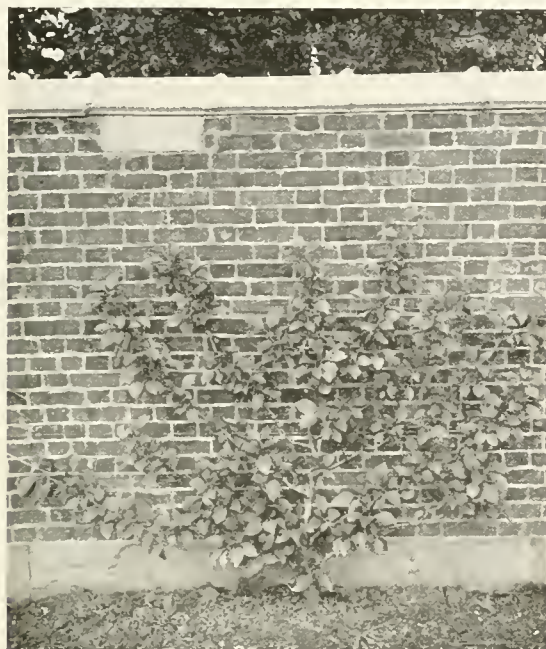
The apple and pear are the fruits most commonly grown in fanciful shapes on walls and trellises, but peach, plum and cherry may be quite as easily trained as cordon or espalier, or in fan, U, or any other of the several figures used on permanent supports. The peach prospers greatly on a protected wall in a cold climate, and may be made to bear fruit annually, where, if planted as a standard in the open, it would succumb to the cold or give but an occasional crop.

Many have the opinion that only specimen plants started in European nurseries can be used for trained miniature trees, but this is not true; one-year-olds from American nurseries may be used. It is, of course, more difficult to train these free-growing Americans, but the pleasure of training is part of the game, and it is a pleasant pastime to "personally conduct" tender yearling whips to crabbed age as handsome trained plants, such as those shown in the accompanying illustrations. As to varieties of the several fruits, there is probably some choice with all if one but knew. So little has been done in America, in training trees other than as standards, that lists of suitable varieties cannot be recommended. With present knowledge, therefore, one can only say, choose choice varieties. Fill the allotted space with fa-



A Dwarf Apple Tree Trained on Espaliers

and are built in the same manner as the American grape trellis, but with heavier wires which are placed ten or twelve inches apart. Fruit trees grown on trellises are ornamental and may well form a background to the flower or vegetable garden; they may be used as borders of paths, or, to divide the parts of a garden. Wooden



A Dwarf Quince Tree Trained Against the Wall

fences properly wired, make suitable places for trellis training.

The plants are set at distances apart that the wall to be covered and the method of training dictate. They should stand at least a foot from a solid wall, but much nearer, of course, to a trellis. There are no special requirements in setting other than that, since the plants are to stand a long time, and to become exceedingly valuable because of the time put on training them, the work should be done well.

The shape to which a fruit tree may be trained can be any one that fancy may choose for a flat surface. The simplest forms, however, are generally the best. As a rule, also, plants confined to a small space are more satisfactory than those covering a large space. The simplest shape for wall or trellis is the single stem, the "cordon" of the French. Trained to a single stem, the plant may be made to grow upright, obliquely, horizontally with one or two arms, or in serpentine fashion.

Trained with two or more stems, the branches may form a fan, may have several horizontal or oblique arms, or may be made to take a U- or double U-form. These are the simplest possible shapes.

The beginner is likely to succeed best with the upright cordon. This is a tree trained to a single stem. Having mastered the simplest upright, he may then place his cordon in whatsoever position fancy dictates. The oblique, horizontal and serpentine cordons are the most in vogue. The names express the positions of the stems, but a word of direction is necessary as regards the serpentine, which is really, however, about the easiest to grow. The stem in the serpentine is bent back and forth in a series of S's one above the other.

Trained to the U-form, the tree consists of two upright branches springing from the trunk in such manner as to form the letter U. The double U can be made by growing two U's on the tree. That is, the stem is divided near the ground into two branches, each of which is

grown to form a U, thus providing four parallel fruit-bearing branches.

The fan, oblique and horizontal forms are sufficiently explained by the names. The stone fruits seem to be particularly well adapted to the fan and similar shapes, while the pome fruits, apples and pears, respond especially well to the cordon, though often grown in the more complex forms.

There are many, many rules governing the training of wall and trellis-trained trees. These come for most part from the Old World and many of them are not applicable to New World conditions. Some of them, however, must be observed. Fortunate is the man in this sort of orcharding, if he can have the advice and assistance of a gardener from the Old World who can train the grower to train his plants. The following hints, taken from Old World fruit books, give the beginner in the



A Dwarf Apple Tree Trained Pyramid Shape

pleasant art of miniature orcharding a working knowledge:

1. Prune strong branches severely; weak ones lightly.
2. Depress strong branches; elevate weak ones.
3. Suppress useless buds on strong parts early; on weak parts delay suppression.
4. Fasten strong parts to wall or trellis early; delay doing so to weak parts.
5. Permit as much fruit as possible on strong parts; remove all on weak parts.
6. Keep strong parts close to the wall; bring forward weak parts.
7. Deprive strong parts of light by covering.
8. In Winter pruning, leave no more branches than are requisite for the development of the tree and the formation of fruit-bearing branches.
9. Repeatedly pinch off Summer shoots that are not required for the development of tree.

Training trees is one of the tasks never finished. Lastly, trees trained on walls and trellises are worth while. There ought to be millions of them in the backyards of cities and towns in this fruit-hungry land of ours. U. P. HENDRICK in *American Fruit Grower*.

The Treatment of Lawns

THE importance of a good lawn cannot be over-estimated. Constituting, as it frequently does, from 75 to 90 per cent of the landscape effect, its condition may enhance or destroy the beauty of additional plantings of shrubs or flower-beds. In spite of this fact, the average householder, while willing to spend both money and time on flowers and vegetables, is content to let the lawn go with an occasional mowing, and then wonders why it is so difficult to maintain a good stand of grass in St. Louis. That it is not as easy to secure as satisfactory a lawn in this locality as in cooler, moister climates goes without saying, but it is likewise a fact that given the same proportionate care and attention as other outdoor gardens the results will be equally worth while. In fact, it is not until we are willing to regard the lawn as truly a garden, just as we would a collection of blooming or fruiting plants, that any real success may be attained. Fortunately, in proportion to its area a lawn once established does not require as much labor or money as most other kinds of gardens. However, one should no more think of attempting to have a lawn without properly preparing the soil, attending to the necessary fertilizing, re-seeding, mowing, etc., than he should think of growing flowers and vegetables without the necessary attention.

Plenty of seed should be used in starting a new lawn, 60 pounds to the acre being about the minimum. Care should be taken to apply the seed evenly, this being accomplished either by hand seeding or by the use of special seeders manufactured for the purpose. The best time for seeding is generally either early in the morning or near evening on a day when there is little or comparatively no wind. August or early September are the best months for seeding. At that time the grass seed will have very little competition with germinating weed seed and enough moisture is generally supplied by Nature to establish the grasses sufficiently to stand the Winter, provided a slight top dressing of well-decomposed manure or bone meal mixed with soil is applied in late Autumn. The bone meal should be given at the rate of 400 pounds to the acre. If it is not possible, however, to sow seed in the Autumn almost any month during the growing season will do, particularly the Spring months, March, April and May. Re-seeding the bare spots on the lawn may be done at any time during the year when the surface of the soil can be worked into a mellow condition with a rake. Seed should always be kept on hand for this purpose, and whenever a bare spot is noticed it should be seeded at once.

The lawn should be tamped or rolled after seeding to bring the seeds into close contact with the soil and to prevent undue evaporation of moisture. The roller should also be used in early Spring to compact the soil which has been loosened by the action of thawing and freezing during the Winter, and also to make the lawn smooth for mowing.

For quick results sod may be used, and steep banks and terraces should always be sodded rather than seeded, as should also the edges of roads and walks along a newly made lawn. It is important that the sod be cut as thin as possible and kept clean and free from weeds, and that the ground be properly prepared before it is laid. Sod properly cut and laid grows very easily, provided it is set firmly in the surface of the ground by the use of a roller or tamper and that it is thoroughly soaked with water until established.

Grass should be cut as soon as it is a few inches high, care being taken to see that the mower is very sharp

so as not to pull out any of the young grasses. This cutting should be continued throughout the season, and it is particularly essential to have the grass short during the Winter.

A good lawn will carry through the season without any artificial watering, but if a greensward is desired during the hot Summer watering becomes essential. When watering, the soil should be saturated to a good depth and then not watered again until thoroughly dry. The general custom of a daily superficial sprinkling is most injurious to the lawn.

Most annual weeds are eradicated by the mower. One exception is the crab-grass (*Panicum sanguinale*), which is most destructive to lawns. It first becomes noticeable at the end of May or the beginning of June, and from that time on it grows very rapidly, spreading the more it is cut and throwing out stems which root at every node. Crab-grass may be held in check by cutting the lawn as little as possible during the month of July and the first part of August, and when cutting to adjust the mower to cut as high as possible. The leaves of the lawn grasses will then shade the soil sufficiently to keep the stems of the crab-grass from coming in contact with the soil, thereby preventing them from taking root. Then, about August 10 to 15, the grass should be cut short, the lawn raked with a sharp-toothed iron rake to make the remaining crab-grass stand up, the grass cut very short again, and the raking repeated. After this the lawn is seeded lightly, cut again, the clippings allowed to remain to protect the seed, and the lawn watered thoroughly. It will be found that this operation has destroyed most of the crab-grass.

Perennial weeds, such as the dandelion (*Taraxacum officinale*), plantain (*Plantago Rugelii*), and burdock (*Arctium Lappa*), may be cut out with a knife, or they may be eradicated by spraying with a solution consisting of two pounds of iron sulphate dissolved in one gallon of water. This should be applied in a very fine spray, five or six times during the season, preferably on a bright day to prevent it being washed off by rain. It should be applied two or three days after mowing, and the lawn should not be mown until two or three days after spraying is finished. This solution will discolor clothes and stone walks.

All lawns should have a top dressing of well-decomposed stable manure at least once every three or four years, and other fertilizers should be used whenever the lawn needs enriching. Sheep manure and wood ashes are excellent for the dressing of lawns. They may be used, mixed in equal parts, at the rate of 200 pounds to the acre. In the Spring, before growth commences, is the best time for application. Bone meal is a slow-working but very good lawn fertilizer and is applied in Fall or Winter at the rate of 400 pounds to the acre. Air-slaked lime or limestone dust will neutralize acidity in soils and make them more suitable for the growth of Kentucky blue-grass. Lime should be used as a Winter dressing at the rate of 35 or 40 bushels to the acre. Nitrate of soda is a very quick-working fertilizer which makes the grass grow very fast and greatly intensifies its color. This should be applied in early Spring, just as growth commences, at the rate of 200 pounds to the acre. To prevent the chemicals from absorbing the moisture of the soil or from the plant tissues the application should be made just before a rain or after watering. Commercial fertilizers should not be applied at the time of seeding, as they may destroy the seed.—*Missouri Botanical Garden Bulletin*.

Ornamental Flowering Trees

ARBORUM AMATOR

It is a common practice both on estates of considerable acreage and on home grounds of limited area to select for planting the several kinds of deciduous and evergreen shade trees, often to the almost entire exclusion of those trees which belong to the ornamental flowering class. It is now recognized by many landscape gardeners that ornamental flowering trees should be in the majority on grounds of small area, and on large estates should be planted very freely in combination with the large deciduous and evergreen trees.

The distinctly ornamental flowering trees embrace a wide range of size, form, and color of flower. Their period of bloom too extends from earliest Spring till late Summer.

For practical consideration these trees may be divided into three classes, small trees which attain to a height of from about fifteen to thirty feet, medium, from about thirty-five to fifty, and large, from about sixty to one hundred or more.

In this issue and in our next also we will speak of the small ornamental flowering trees, and in subsequent issues of flowering trees of medium size, and in still later issues of those of large size.

The smaller flowering trees are suitable for planting on grounds of quite limited area, either as individual specimens on lawns, or amid low growing shrubs, or along the boundary line. These make up with their wealth of pretty blooms what they may lack in shade giving quality.

Flowering Dogwood. The flowering dogwood (*Cornus florida*) is one of our hardiest and most beautiful native trees; it has spreading branches and usually grows to a height of 15 to 20 feet, but sometimes, though rarely, 30 to 40 feet. This species produces in May, before it puts on its foliage, in the greatest profusion its sessile clusters of small, greenish-yellow flowers, surrounded with a very showy white or pink involucre composed of four large bracts. This involucre is the conspicuously beautiful feature of this species and is commonly considered the flower itself. The flowers are followed by bunches of red berries in Autumn. The color of the foliage in Autumn is characterized by extremely beautiful and delicate hues. There is no better all-season medium sized ornamental flowering tree than the dogwood. This tree may be planted anywhere, in the sunshine, or in shady places; it harmonizes with everything, and fits in well everywhere, among the shrubbery, amid the pines and cedars, in the foreground of the large shade trees, in the hedge rows, and on the lawn. There is a red variety, *rubra*, which is exceedingly desirable and should be planted as freely as the white species, *florida*. Besides these two, there is a third species of more recent introduction known as Japanese Dogwood (*Cornus Kousa*), a beautiful small tree, the bracts of whose involucre are more pointed than those of *florida*. This species flowers when in full leaf and remains in bloom a long time in May and June. Furthermore in Autumn this species is well covered with globular Strawberry-like edible fruit.

Varnish Tree. The Varnish Tree (*Koelreuteria paniculata*) is a native of Japan. It is one of the few trees which flowers in the Summer, blooming in Washington, D. C., in early June and in New England in

early July and producing panicles a foot long of beautiful yellow flowers which are succeeded by large bladder-like seed pods at first light brown but changing later to olive brown. In Autumn its glossy, pinnately divided foliage assumes beautiful shades of color. This tree is hardy as far North as Massachusetts, and may be planted safely in the West where other trees would succumb to drought and hot winds. It makes a very irregular growth, hardly ever having a straight body, but this very habit of growth makes the *Koelreuteria* desirable as it relieves the monotony of a collection of trees all with straight trunks. Its form is rounded rather than tall which displays its flowers more advantageously. This tree transplants easily. It attains a height of 15 to 30 feet.

Styrax. There are five species of the *Styrax*, two of which grow in tree form reaching sometimes a height of 30 feet. They are natives of Japan and China. The two tree species are *Obasia* and *Japonica*. Their foliage resembles somewhat that of the Dogwood. The fragrant white flowers of *Obassia* are produced in May in racemes about 6 in. long, and those of *Japonica* in June and July. These two *Styraxes*, when kept in strictly tree form are suitable for planting as single specimens or in the foreground of larger trees. They are hardy as far North as Massachusetts.

Silver Bell. The Silver Bell also called Snowdrop tree (*Halesia tetraptera*), a pretty little tree native from Virginia Southward, but quite hardy as far North as Philadelphia and even as far as New York City, has a somewhat rounded head, but a rather irregular habit of growth. In May its flowers, resembling those of the snowdrop, hang gracefully from its spreading branches, amid its dark foliage. This tree flowers when quite small. Its proper place is on the lawn, or among shrubbery, or in the extreme foreground of larger trees. It sometimes reaches a height of 30 feet. The Silver Bell can also be grown in shrub form, in fact it has a decided tendency to grow that way, but can by proper pruning when young be grown with a single bole and in tree shape. Pruning should be done directly after the flowering period. There is another species, namely, *diptera*, a native from the Carolinas and Southward, but nearly as hardy as *tetraptera*. There are Silver Bell trees 50 years old growing in Pennsylvania and as far North as Elizabeth, N. J., and Darien, Conn.

Wistaria Tree. The Wistaria Tree (*Pterostyrax corymbosa*), closely related to the *Styrax*, is a native of Japan. It is barely hardy as far North as Massachusetts even in well sheltered positions. In June its graceful drooping panicles of fragrant, white flowers appear in great profusion and are similar in general appearance to those of the *Deutzia*. This tree has a spreading habit of growth and a rounded outline and attains a height of 15 to 20 feet, but begins to flower when very small, and it is, when in flower, surpassingly beautiful.

Golden Chain Tree. The Golden Chain Tree (*Cytisus laburnum* or *Laburnum vulgare*) is a native of Southern Europe. In early Summer, when its drooping racemes of yellow Wistaria-like flowers appear amid its shining green, pinnately divided leaves, this tree is indeed a beautiful sight. There are several other varieties and

species, namely, *Adami* with purplish flowers, *Schipacensis* a white flowering dwarf variety quite suitable for rockeries, also *Fossii* which is a very free bloomer, and *Watereri*, whose blooms are a much deeper yellow than the others.

Keats mentions the *Laburnum vulgare* in one of his poems descriptive of a country scene:

"A bush of Mayflowers with the bees about them—
Ah, sure no tasteful nook could be without them,
And let a lush laburnum oversweep them,
And let lone grasses grow around the roots to keep them."

The hot, dry air of this country is not as favorable to the *Laburnum* as that of Europe, therefore it should be planted in a situation where ground is damp and will supply moisture and coolness to the roots. The *Laburnum* will be further benefited by the shade cast by a building or a tree, but should not be planted where it will be directly beneath trees or close to the side of a building.

Hawthorn. The Hawthorn of English literature, (*Crataegus oxyacantha*) is a small tree, growing to the height of about 15 feet. This species is a native of Europe and Northern Africa. Its branches bear stout spines, but its foliage is pretty. Its single white, or in the variety *alba flore pleno*, double white, or in *rosea flore pleno*, double pink flowers, appear in May, and are followed by red fruits. The Hawthorns are hardy and in the Autumn their leaves put on a brilliant coloring which adds to their attractiveness. There are besides *oxyacantha* a large number of other species of *Crataegus*, the fruits of some being edible in the form of preserves or jellies. Hawthorns will thrive in exposed situations and are not suitable for planting in shaded locations.

The poet, Scott, speaks of the Hawthorn growing with the hazel, and eglantine:

"Here eglantine embalm'd the air,
Hawthorn and hazel mingled there."

This story of the ornamental flowering trees will be continued next month.



FRIENDS

I wonder how my garden friends
Are growing far away.
I wonder if they miss me too
And look for me each day.
Does anyone with tender care
Lift up the larkspur's head
When ruthless winds bend low each stem,
Or is it brown and dead?
Do golden poppies glow with cheer
When waked by morning sun,
And softly close their cups and sleep
When each bright day is done?
The pansies with their saucy ways,
Have they their secret freed
Of longings I exchanged with them
For heartease in my need?
And sweet alyssum, dainty child,
My garden baby, you,
Have ruthless feet been careless,
And made your days but few?
I wish that Winter's breath would stay
Away from you away,
That I might wander back again
And visit you some day,
But Mother Earth is calling you
And we must stay apart.
Leave me your gentleness and peace
To grow on in my heart.

—Edna Eastwood.



A portion of the Rock Garden on Mrs. T. J. Emory's Estate, Mariemont, Newport, R. I.

Oh! that I could have sent you this picture in its richness of a coat of many colors, the sun sending its rich rays to add to the existing beauty! I venture to say no artist could reproduce such a picture with the various plants and shrubs in such a blending of colors. Note how splendidly they are grouped. What a perfect background! These huge rocks, weighing many tons, were hauled there by the superintendent, A. Dorward, well known in his profession, who personally designed this beautiful piece of work.—A. M. Horn.

Twelve Most Desirable Shrubs for Gardens

ARTHUR SMITH

In devising a planting scheme some considerable thought should be given to it, and from several points of view the smaller the place the greater the amount of thought which is required, especially with regard to the selection of species. The common fault which one sees is the planting of too many species and overcrowding.

At this time it is not possible to discuss the question of ornamental planting as a whole, but in view of the fact that over-crowded shrubberies are the weak spot in many gardens, it appears worth while to set forth a few of the easiest grown things among shrubs with a view of assisting those desirous of making a selection among those enumerated in the extensive, and (to some) confusing lists found in nursery catalogs.

Out of hundreds of shrubs we will select a dozen which may be classed as indispensable, and which are easily grown and hardy in the northeast.

As being the earliest to bloom *Forsythia* must be mentioned first. Of this there are several well known species but the best for all-round purposes is *fortunei*.

Following this is the beautiful and deservedly popular Lilac, which most people would plant if they had room for only one. There are many species and varieties, but care must be taken never to plant grafted plants as there is no excuse for any other than own-rooted ones being used. It is a common practice to graft upon privet or other common stocks, the suckers from which are worse than useless. The old European *vulgaris* is the most sweet scented, of which there are both white and purple flowering kinds. Of late years the Lemoine hybrids have been more used as they have larger flowers and spikes, but many of them are scentless. Among the best of the hybrids are *Marie Legraye* (white) and *Gigantea* (bluish).

There are many *Spiræas* suitable for the home garden, but the best is perhaps *S. Thunbergii*, which grows up to five feet tall and flowers in April and May; it has additional value on account of its foliage turning in the Autumn to a brilliant orange and scarlet. Another good one is *S. van Houttei*, considered by some to be preferable to the former. It grows somewhat taller and flowers a little later. The smallest garden has room for the pretty little *Bumalda*, variety Anthony Waterer. It only grows about two feet high, and two crops of its bright crimson flowers may be obtained by cutting off the first spikes as soon as they are over. For the best results it should be cut nearly to the ground each year. Its young foliage is prettily marked with white and crimson.

There are few shrubs more satisfactory in various directions than the Japanese Barberry (*Berberis Thunbergii*). It is cast iron in its hardness, and for a hedge which is not required taller than four feet it is the best plant. Its bright green foliage appears in the Spring before anything else; this is followed by yellow flowers. In the Fall the foliage changes to a pleasing shade of red, and its scarlet berries remain on until after the new Spring growth. As with other shrubs, it is spoiled by shearing; any reduction in size required may be done by cutting out the older growth close to the ground.

Room should always be found for at least one plant of *Hydrangea arborescens*. Its white flowers are borne

with profusion after Mid-Summer, and they last well when cut. It reaches the height of about three feet and is another shrub which should be cut nearly to the ground each year for the best results.

Bush Honeysuckles are easy to grow, but require a good deal of room, as they may ultimately reach a height of ten or twelve feet and of even greater spread. The species known as *Lonicera Morrocci* is the best, which bears a profusion of rather small light pink flowers, followed by bright red fruit.

A spreading shrub of medium height is *Diercilla*, otherwise known as *Weigelia*. This bears an abundance of flowers during early Summer. There are several species and varieties worth planting having flowers ranging from white to very dark red, among which can be recommended *Le Printemps* as an early pink, and *Eva Rathke* as a late red.

Among the several good kinds of *Deutzia* the best for a small garden is undoubtedly *Lemoinei*, which grows into a close, rounded form and in May is absolutely covered with a mass of pure white flowers. *Crenata* and its varieties are good where shrubs six feet tall are required, of these *Pride of Rochester* is a good one, having large double flowers tinged with pink.

Undoubtedly it would be an impossibility to find an old-fashioned garden without a *Syringa* or Mock Orange (*Philadelphus*), and there are few who would desire its absence, not only on account of memories of the past, but also by reason of its fragrant white flowers and its always clean foliage. Its ultimate height causes it to look best at the back of dwarfier plants, and also because it has a tendency to grow bare of foliage at the bottom. This may be, however, to a great extent guarded against by annually cutting out the oldest wood close to the ground. The tallest and most deliciously fragrant is *P. coronarius*, but the Mont Blanc variety of *Lemoinei* has larger flowers, which are borne more freely, but they are not quite so strongly scented.

While roses, in the forms of hybrid teas, remontants and such like, have to be specially cared for in a border or garden by themselves, there are some that may be classed as shrubs, and in fact are only fitted for a shrubbery border. For this purpose *Rugosa* is the best, and it has now varieties with flowers varying in color from white, through pink, to red. Its foliage always keeps in good condition and its large crimson fruit adds to its pleasing features. When it is required to cover a fence or unsightly shed the native Prairie Rose, *Rosa setigera*, is very suitable, as it is a rampant grower and its pink and white flowers are produced in July when most of the climbing roses are over.

Our next selection is *Viburnum*, a genus which is perhaps best known by the Snowballs and the old Guelder Rose, in some of which the foliage is not very satisfactory, and in any case the single-flowered kinds are preferable because they also produce ornamental fruit. The native *Viburnum opulus Americana* grows eight feet tall, and its berries remain all Winter; its brilliant Autumn foliage gives it another valuable feature. The best native species is *V. cassinoides*, which is also the best suited for small gardens. It is very hardy, as it is found near the Arctic Circle. Its fruit ultimately becomes bluish-black, and is very handsome; a singular and really good feature connected with its fruiting stage is that the fruit does not ripen all at once, so that green,

rose and bluish colored berries are to be seen on a cluster at the same time. It flowers in late June. A smaller species, and one of the most charming of the genus is *V. carlesii*, a Japanese kind, with pinkish, fragrant flowers which are produced early. While this is hardy, it is somewhat less so than the preceding.

For the last a late blooming kind seems desirable, for which purpose *Lеспедеза Sieboldii* is suitable, as its long racemes of rose-purple flowers are effective in September and early October. It should be cut down to the ground each year and its crown mulched with old stable manure.

As an alternative to the preceding, *Abelia grandiflora* is in some ways preferable by reason of the fact that its beautiful, light pink, heath-like flowers are produced continuously from June until killing frosts. Its habit of growing on late in the season prevents the tips of its shoots having time to ripen, and these are sometimes

killed back under severe conditions, but even when this occurs, a few moments' pruning will put things right, and this killing back does not affect subsequent flowering. Anyhow, a sheltered position should, if possible, be found for it, together with Winter protection in the north. I have known it pass safely through a temperature of twenty below zero.

While there are numerous kinds of shrubs equal in value to those selected, the ones mentioned are easily grown and will give a good account of themselves in all ordinary soils, but naturally the better the treatment given them the better the results. At this time we have alluded only to shrubs because, as above stated, the shrubbery is too often the weakest point in a garden, and if one-tenth of the trouble wasted upon tender "bedding out" and other fleeting expensive plants, is spent on flowering shrubs our gardens will be all the better for it.

Our Friend the Soil

IT is probably a universal condition, but most people are more interested in what comes from the soil than in the soil itself.

Even we florists and nurserymen, whose every work connects us up close to the soil are so intent on what we consider our products that we give little thought to this common but all important fundamental.

The old saying "Common as dirt," is quite true, but it is well to remember that "dirt" or soil is one of the three most essential things on which the human race is dependent.

Sunlight, Moisture and Soil are a trinity without which there would be no trees, no flowers, no food, no life. The time of the year is almost here when all the "sons of the soil" will take part in its tillage. The farmer, the nurseryman, the fruit grower and the florist, each has his own particular sphere of labor in joining hands with Nature to bring forth products of perfection.

It is quite an easy error to claim for him who has tilled the ground and sown the seed, the honor and authorship of the crop. We do not sufficiently realize, or else we forget how much is due to Nature's laborers, who are unceasingly at work for us.

Our farms and gardens, if left to our own efforts alone, would present a sorry condition, but with the great work done by sun, rain, dew, frost, snow, wind, bees, etc., we are able to produce wonderful results from our friend the soil. The part we have to play in company with these several agencies mainly consists in cultivation, fertilization and planting. We sometimes hear people speak of a rundown farm. As a matter of fact it is the lack of effort to cultivate and to plant the right things that is mainly the fault.

Soils that are deeply dug and frequently cultivated are invariably highly productive. What a variety of soils there are in color, texture and fertility! The color of a soil is not always indicative of its fertility.

It may be red, brown, black or gray, and be equally poor or fertile. The most fertile soil is one that contains the highest percentage of available plant food, i. e. food that is soluble in water and that can be assimilated by the plant.

Texture, another visible difference in soil is known chiefly by the actual handling or walking on it. A soil with a large percentage of clay will tenaciously cling to one, while a sandy soil is readily released. Native growths tell us unmistakably, something of

the kind of soil in which they grow. Wet, marshy or ill drained land is indicated by the presence of sedges, rushes, etc. Rhododendrons, Kalmias and other ericaceous plants will invariably be found in acidulous soils or where there is humus in quantity. Beech and Pine on poor and limestone soils. Oak trees indicate a good tenacious clay soil.

Thus it is that in going through parts of the country by train one is able to form a fairly good idea of the kind of soil by the character of the native growth.

All soils can be roughly classified into four, viz:

1. Sand loam: 10 to 40 per cent of clay.
2. Loamy soil: 40 to 70 per cent of clay.
3. Clay loam: 70 to 85 per cent of clay.
4. Strong clay: 85 to 95 per cent of clay.

Number two is the best soil for all general purposes, containing a better proportion of clay, sand and humus.

Everything grown can be traced back to two primary sources—soil and atmosphere.

We have not the power to change or affect the latter to any great extent or for any length of time, but we have the power to change the soil by adding to it those constituents of which it may be lacking.

If a soil is too acidulous, administer lime, which reacts on the acids, and greatly aids the decomposition of organic matter, promoting the formation of nitrates which are available plant food.

If lacking in nitrogen, add humus, either by green manuring, farmyard manure, or some other artificial fertilizer, which is rich in nitrogen.

Some soils are deficient in potash and phosphates. This may be made by applying bonemeal and wood ashes in Spring. Clay may be given to sandy soils, and sand to clay soils, while humus in its varied forms is used to suit different conditions of soil.

Not least of all is the great power we can exert in changing the physical condition and increasing its fertility by cultivation.

We are living in days when implements of power hitherto unthought of are in force, what with tractor-plows and cultivators, dynamite to disintegrate impervious and hard stratas, artificial irrigation, etc., we are able to bring the most stubborn and unfertile soil into a condition that will enable it to bring forth fruit in abundant measure, and so reward those who diligently and actively cultivate the friendship of the soil.

—EDWIN MATHEWS in *The Florists' Exchange*.

The Bees in Spring

HENRY W. SANDERS



Young brood in the hive proves the presence of a laying queen.

CONDITIONS of climate, etc., in different regions of the United States differ so widely that in writing about the Bees in Spring it is necessary to begin by saying that what is here written applies to the Northern States, these being the ones which contain the greatest number of bees, although perhaps the more favored regions, such as California, or the irrigated parts of Colorado and other Western States, may boast the greatest number of specialist beekeepers, and in consequence, the greatest

and most spectacular honey crops. We are, however, catering here to the amateur beekeeper or the gardener who keeps bees as a sideline, and therefore will deal with the problems of Spring from the standpoint of the Middle and Northern States.

In these regions, then, the bees have passed the Winter in a state of somnolence—not actually hibernating like so many other insects, but clustered closely together within the hive, and by consuming honey keeping the heat of the interior of the cluster up to a point comparing with the “blood-heat” of the higher animals. They will have been protected by the beekeeper by packing, or in the far north by placing them in a frost-proof cellar. When the snows of the Winter have disappeared and the genial sunshine of April announces to man and beast and bee that Summer is at hand, they will be carried out and placed on their Summer stands.

It is at this point that the bees begin the most critical period of the year, for they must breed fast enough in the next few weeks to replace the hundreds that have died during the Winter, and in addition to provide the forces necessary to constitute a swarm. In fact, a colony that has twenty thousand bees on April first, will sometimes have fifty thousand on June first. Each bee takes three weeks to hatch, so that it will be seen that any interruption of brood-raising has a serious effect on the well-being of the hive.

As the queen is the layer of all the eggs in the colony, it is of the first importance that she should be young, vigorous and of good breeding. This is a matter that should have been attended to last August, a time of year when all inferior queens should be replaced. In Spring the only thing to do is to send to a southern breeder for a few spare queens to arrive in May and then to replace any defective ones. Poor queens are evidenced when the bees of the hive are few in numbers, or of mixed color (indicating a “hybrid” queen), or vicious, a quality that ought not to be endured. If a colony comes out of the Winter quarters without any queen it is not much good trying to re-queen it. The better plan is to unite it with a queenright colony. If one wishes to experiment, then give them a little brood to keep them from getting “laying-workers,” and send away for a queen. It is sometimes successful, but so often the reverse that uniting is better. There is generally a weak colony with a laying queen that will be strengthened with the bees so added. Uniting is done by

placing the two hive-bodies in contact with a single thickness of newspaper between.

Weak colonies are often a problem, especially if the wintering has been under unfavorable circumstances. The usual advice is to join them one to another, and while this solves the matter, it involves a waste of queens, as in the united colony there will be only one survivor of the two queens placed together. The better plan is to keep the colonies separate and then build the stronger ones up by taking brood from the weaker. The natural impulse is the other way—to take from the stronger for the weaker ones. In practice, however, this results in having all colonies weak when the honey begins to come in. By building up a few powerful colonies a crop of honey can be gathered and they do so much better that before the season is over they will repay with interest the brood they received from their weaker brethren.

Protection from the cold winds of Spring is desirable, and this is best accomplished by wrapping the hives in tar paper. The cover is removed, but not the “Quilt” beneath, and the paper is then wrapped over and around the hive and secured with a piece of lath and a nail. The entrances are also made very small, both to conserve heat and to prevent robbing. A windbreak of trees, shrubbery or a board fence should be upon the north and west sides of the yard.

An abundance of food is very necessary for the brood-rearing of Spring. On a warm day when the bees are flying, the first work of the season consists in going through the hives and seeing that each one has plenty of food. Those that are short can usually be supplied by sparing a comb from those that have plenty, or if there is none available they can be fed syrup made of equal parts of granulated sugar and water. Any of the feeders on the market are good, or a home-made one that does very well is made by punching a few holes in the cover of a tight can, filling it, and inverting it over the bees within an empty super. In any feeding operations care should be exercised not to expose any syrup or honey where the bees can get at it, or robbing may be started.

At the time when the Spring examination is made it is well to make sure that each hive has a queen, and is strong enough to get through to the honey-flow. Then if all is well, wrap them up in paper as described above and let them alone till settled warm weather comes.

Bees need an abundance of water in Spring for their brood rearing operations. If there is a natural stream or creek near by, they will visit this, but unless one is quite close it pays to provide water right in the beeyard. A crock, tub or barrel, with pieces of wood floating to prevent the bees from drowning, will serve, and some salt is usually placed in the water to sweeten it.

In the next number our subject will treat on the Swarming Time.

LEARNING

Learning taketh away the wildness and barbarism and fierceness of men's minds, though a little superficial learning doth rather work a contrary effect. It taketh away all levity, temerity, and insolency by copious suggestions of all doubts and difficulties and acquainting the mind to balance reasons on both sides, and to turn back the first offers and conceits of the kind, and to accept nothing but the examined and tried.—*Bacon*.



Fountain at the Front Entrance of Residence



View of the J. Ogden Armour Residence

**Mellody Farm,
Country Estate**



Entrance to Rose Garden



Du



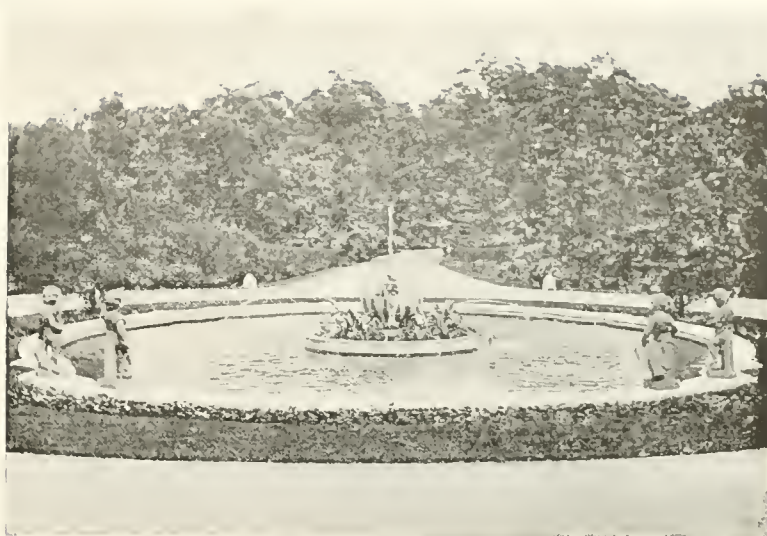
Rose Garden



W



Lawn, Melody Farm, Lake Forest, Ill.



Fountain and Court Yard

Forest, Illinois

gden Armour



Pools and Casino



Artificial Lakes



Main Entrance to Mellody Farm, Showing Gate, Lodge and Garage

When J. Ogden Armour a few years ago decided to build a country home at Lake Forest, Illinois, he selected for his site a number of farms containing in all twelve hundred acres of what may be practically considered prairie land. The transformation that has been successfully accomplished in the comparatively few years since that time from an unadorned stretch of prairie land into one of the most beautiful landscaping developments in the country, stands as a monument to the architectural ability and general skill of the professional gardener.

Mellody Farm, as Mr. Armour's country place is called, is, from a horticultural point of view, one of the most interesting places in the Middle West, comprising as it does so many gardens of various types, among which one may enumerate a winter garden, a Dutch (bulb) garden, a perennial garden, a rose garden, a water garden, an orchard garden, a vegetable garden and, not the least important, an extensive glass garden, for the greenhouse range on Mellody Farm is probably the most complete of its kind in the West.

The different gardens are connected by winding paths through planted shrubbery and natural woodland, opening on unexpected vistas of beautiful lawns and terraces with glimpses of small pools, or the artificial lake in the distance.

The landscape features have been so arranged as to give several unobstructed views of the ornamental grounds from the home. Specimen trees and shrubs abound. Fountains, cascades, modern and antique statuary are generously distributed about the grounds.

A casino and a rest temple of stone, stucco and terra cotta are other ornamental characteristics of the estate.

In the development of Mellody Farm, Mr. Armour has been thoughtful for the comforts of the men employed on the estate. The gardeners' cottage has



Grape Arbor, Gardeners' Cottage in Background, Armour River Privet Leading to It

practically all the conveniences of an up-to-date club building, with a large living room that is provided with an extensive library. Among the other conveniences are shower baths and facilities for preparing and serving meals for a large number. The recreation building contains billiard and reading rooms and a moving picture apparatus.

It is not all work and no play at Mellody Farm. During the past winter two hockey teams composed of the employees among the gardeners competed for a silver cup donated by Mrs. Armour, for which games two half holidays were declared each week.

Thomas W. Head, who has been in charge of Mellody Farm as its superintendent the past five years, is well and widely known in the horticultural field of this country. He is a past president of the National Association of Gardeners and at the present time its treasurer; and is also president of the Chrysanthemum Society of America.



Reading and Recreation Hall for the Employees of the Garden Department

The Use of Wild Plants in Ornamental Planting

ALEXANDER LURIE

IN the great abundance of native and foreign plant material which is commonly utilized for beautifying the landscape, the plants which are growing wild in the surrounding country are often overlooked. The fact that they are a common sight along the roads, in the fields, through the woods and along the creeks is often considered a detriment. Yet in naturalistic planting what is more appropriate than the use of material native and suitable to the region. A great ado is made of the possession of exotic plants and even monstrosities by enthusiastic gardeners but the numerous showy and useful plants which surround us are looked upon with scorn. Great pride is usually taken in the successful growing of foreign plants through various expedients of petting and painstaking care known to the skillful gardener, while the easily grown and readily adaptable native flowers are discarded as not worthy of attention. It is a pity that such a state of affairs should exist. So many city homes look gloomy and unattractive, so many suburban and country homes lack the finishing and enframing touches of Nature, so many houses appear bare and unsightly because of the feeling that means of floral decoration are so costly and not to be afforded except by the well-to-do. Yet why cannot a school teacher of a country school undertake a short expedition with a class into the surrounding country and with a little judicious effort and very little time carefully dig up plants indigenous to the region and plant them around the school house, making it attractive and instructive to the younger generation, instilling a spirit of reverence and appreciation of the beauties of Nature instead of destruction. This surely is one of the means of developing the usually latent artistic taste in the average boy or girl. Why cannot the house owner or tenant profitably spend a day with his family in the same pursuit, making his dwelling not merely a house but a home. To the uninitiated, it is surprising what a great deal of material may be collected and brought in during a day.

The one cause of failure and disappointment lies in the fact that the amateur collector uses little judgment in the selection of plants with regard to their suitability to the environment and growing conditions. No pains are taken to observe closely the conditions under which the plants thrive in the natural state. A common occurrence is to see moisture loving flowers placed in the driest of locations or the reverse; or to find shade loving things compelled to endure the scorching rays of the sun throughout the day; or to prepare a rich soil intended only for gross feeders, for plants growing among rocks or poor sandy soils; or to neglect the use of a Summer or a Winter mulch as the case may be, for plants naturally thriving only by such means. Proper observance of these various seemingly unimportant details may spell success and save countless disappointments and abandonment of further efforts.

It is true that all plants possess a certain amount of adaptive powers, which may be depended upon to aid the gardener in his efforts in naturalization. Dependence may be placed upon this quality providing it is correctly translated into the garden conditions. It must be remembered that at best gardening is not a natural process, and very few plants receive the most ideal conditions, and it is only by application of common sense combined with knowledge of natural conditions and limits of plant adaptations that the skillful gardener achieves apparently magical results. The case of man-

ure is the commonest of examples. It is used as an artificial aid to the growth and as a protection from drought or cold. There are many plants that thrive through its use, while others are injured by direct contact with it requiring it merely as a mulch. It is in such cases as this that discretion and caution must be exercised. The selection following includes trees and shrubs which abound in Nature, are showy, ornamental and desirable from many points of view, but which are either rarely used in ornamental planting or not at all. In a great many cases they make fitting substitutes for the commoner plants seen in gardens.

The host of trees available for ornamental planting would seemingly preclude the advisability of adding still others to the list for fear of confusing the ambitious amateur, who generally is already bewildered and uncertain of his choice. Yet a few trees stand out so prominently among our native flora and adapt themselves so admirably to conditions near their nativity that at least a brief mention needs to be made. When thinking of oaks, the white, red, scarlet, pin and one or two others are generally considered. Of course, oaks are to be recommended with caution because of the difficulty of transplanting because of their long tap rooting propensities, but when properly handled what is more desirable than the majestic Burr Oak (*Quercus macrocarpa*) with its rounded top of parti-colored foliage and its large mossy acorns. Another of the oaks deserving of a wider use is the shingle oak (*Quercus imbricaria*). It is a medium sized, round-headed, dense tree, particularly conspicuous for its large entire glossy leaves, which often remain all Winter. Still another oak worthy of mention is the swamp white oak (*Quercus bicolor*). Its pyramidal form during the early stages and the broad top at maturity combined with its lustrous foliage make it a peer among specimen trees. The chestnut oak (*Quercus Muhlenbergii*) may also be added to the list.

To the list of Willows may be added *Salix humilis*, *Salix Wardii*, *Salix tristis*. The Prairie Willow (*S. humilis*) and the Dwarf Gray Willow (*S. tristis*) are very useful for quick low effects. They are so dwarf as to be really classed with shrubs and may be used for such a purpose. *S. humilis* reaches a height of 10 feet, while *S. tristis* rarely ever grows higher than 3 to 4 feet. *Salix Wardii* is a small tree reaching 30 feet in height and may be substituted for the black willow.

The Cork Elm (*Ulmus racemosa*) cannot replace the particularly pleasing vase form of the American Elm or the stately shape of the Scotch Elm, but it is an extremely useful narrow headed tree with pendulous winged branches attaining a height of 60 to 70 feet.

What has been said of trees applies even in a greater measure to the shrubby material which is so essential in every planting scheme. There is a sad want of variety among the shrubs used in the average garden. Faith is placed only in a few of the tried and true plants which in many cases are not even ornamental at their best. The great wealth of material available for the purpose is rarely known even by some of the professional planters. The brief accompanying list merely includes the native shrubs which are little used and are not often listed in nursery catalogs. This list does not by any means exhaust the desirable shrubs which may be found with a slight effort. It merely serves as a reminder of the good things close at hand waiting to be used in company with their more commonly cultivated relatives.

<i>Botanical Name.</i>	<i>Common Name.</i>	<i>Height.</i>	<i>Color.</i>	<i>Time of Bloom.</i>	<i>Remarks.</i>
<i>Amorpha canescens</i>	Lead Plant	2 to 3 ft.	Blue	June	Profuse flowers. Dense growth.
<i>Baccharis halimifolia</i>	Groundsel Tree	6 ft.		Sept.	White fruit. Dark green foliage.
<i>Benzoin aestivale</i>	Spice Bush	8 to 10 ft.	Yellow	April	Aromatic foliage.
<i>Cercis canadensis alba</i>	White Judas Tree	12 ft.	White	April	Rare. Desirable.
<i>Ceanothus americanus</i>	New Jersey Tea	3 ft.	White	June	Spreading. Profuse bloomer.
<i>Cephalanthus occidentalis</i>	Buttonbush	5 ft.	White	July	
<i>Cornus alternifolia</i>	Dogwood	8 ft.	Yellow	June	Very distinct, with branches in layers.
<i>Cyrilla racemiflora</i>	Leatherwood	8 ft.	White		Lustrous foliage. Numerous flowers.
<i>Hypericum prolificum</i>	St. John's Wort	3 to 6 ft.			Lustrous foliage. Numerous flowers.
<i>Hypericum densiflorum</i>		3 to 6 ft.		July	Lustrous foliage. Numerous flowers.
<i>Ilex decidua</i>	Holly (Deciduous)	12 ft.			Berries very attractive in Winter.
<i>Ilex verticillata</i>		6 ft.	Yellow	June	Red fruit, very attractive for mass.
<i>Ptelea trifoliata</i>	Hop Tree	8 to 10 ft.			
<i>Rhamnus caroliniana</i>	Indian Cherry	8 to 10 ft.			Lustrous foliage, attractive black berries.
<i>Rhus canadensis</i>	Fragrant Sumac	3 to 4 ft.	Yellow	April	Banks.
<i>Staphylea trifolia</i>	Bladdernut	6 to 7 ft.	White	May	Attractive fruit.
<i>Symphoricarpos occidentalis</i>	Wolfberry	2 to 6 ft.		June	Drooping habit.
<i>Zanthoxylum Clava-Hercules</i>	Prickly Ash	15 ft.			

—Journal of International Garden Club.

GROWING ORCHIDS FROM SEED

THE restriction recently placed by the Federal Horticultural Board on the importation of orchids has given the orchid grower an extremely difficult problem to solve. Orchid raising is in its infancy in this country, the American hybrids possibly aggregating not more than 1 per cent of those tabulated in the Orchid Stud Book. In European countries hybrids have been raised for years in the various private collections, particularly in England and Belgium. During the war the finest collections of the latter, however, were lost.

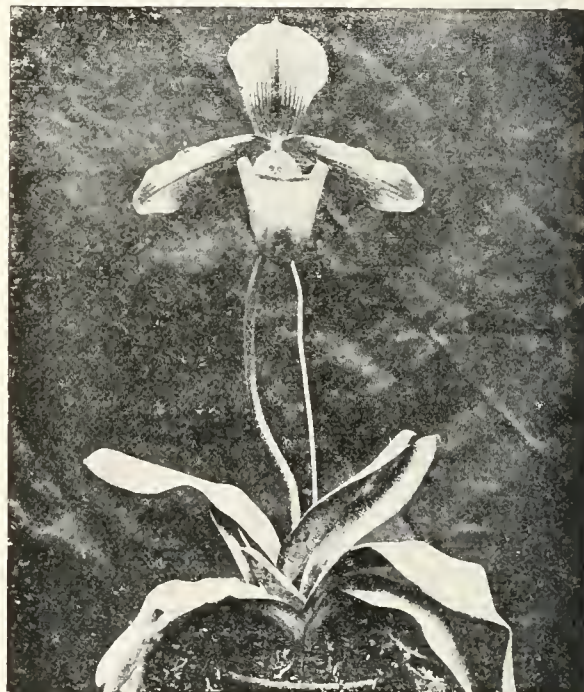
In recent years the commercial florist has sold the *Cattleya* orchid at the same price as roses and commoner flowers, and considerable experience has been required to place the coveted flower within this reach. It is generally conceded that the *Cattleyas* of the *labiata* type deteriorate under artificial cultivation, and periodical importations from the tropics, by the thousands of cases, have been necessary to maintain the floral supply. If the future supply will all have to be raised from the almost microscopic seeds the minimum period of five years will be necessary, and the orchid flower will again be the choice rarity of the millionaire. The germination of the seeds depends upon the action of a symbiotic mycorrhizal root fungus, without which failure is certain. During the entire period from pollination to the flowering stage the plants demand constant attention. Eight to ten months is necessary from the pollination of the flower to the ripening of the seed pod and at least five years from pollination to production of flowers. Thus, while the orchid hybridist is waiting for his seeds to develop other hybridists experimenting with Sweet Peas, Carnations, Water Lilies, etc., have raised their plants to the flowering stage.

Insects upon imported orchid plants, according to our observations covering a number of years, are extremely rare. In fact, during the last fourteen years, only two shipments were infected with borers. These are commonly referred to as the orchid fly and the *Dendrobium* beetle, and their eradication, according to our experiments, was a simple matter. In the early stage the presence of the larvæ is indicated by an abnormal swelling of the young growth from strap-shaped to pear-shaped.

Unless the government order is rescinded the florist will have to turn from the showy epiphytic types to the terrestrial or semi-terrestrial lady's slippers. Raising even this variety from seed would not be profitable. The

present stock of orchids in this country may be rapidly increased, however, by the annual division of the vegetative growths which readily adapt themselves to this medium of propagation. In the Western States it is essential to divide the parent plants periodically to increase flower production.

A new hybrid lady's slipper raised in the Garden orchid houses during the last five years has just produced its first flower. This is the first slipper orchid



raised at the Garden to reach the flowering stage and will bear the name of "D. S. Brown" in honor of the man who brought the Garden orchid collection up to the present standard. The parents of the hybrid were *Paphiopedilum barbatum Crossii*, a native of the Malay region, and the hybrid *P. Harrisianum superbum*. Both were dark-flowering types, but the color of the offspring is greenish yellow with a prominent white dorsal sepal, the upper portion being flushed with bright purple.—*Missouri Botanical Garden Bulletin*.

Nesting Boxes to Attract the Birds

PAUL B. RIIS

IT is an encouraging sign of the times to find so much interest among the children to protect the native bird life. Much of this is due to courses of education given in schools and much more to the efforts of the junior Audubon Societies. This interest is forcibly demonstrated in many spirited bird house contests, in which the zeal and patience displayed in making attractive bird dwellings is truly inspiring.

In looking over a bird house exhibit, as spectator or judge, the impression has ever prevailed that somehow the instructors had given full rein to the fancy of the individual to build according to his artistic temperament. For consequence among many practical boxes there are found perfect imitations of bungalows, complete in every detail with doors and windows, lapped siding, shingled roof and a chimney intended to house a family of bluebirds. Now bluebirds have been known to occupy such a building successfully where nothing else offered, but a smaller and simpler nesting box would have proven more satisfactory and safer for the purpose on hand. The greatest criticism centers on houses too large and too deep for any purpose, with openings that would with equal comfort admit a wren, a squirrel or a cat. Other conspicuous designs noted represent straw-covered tepees, chickadee apartment houses, triangular and pyramidal structures for wrens, batteries of pendant logs, graduated for one, two or three apartments, Dutch windmills, covered straw huts, tin crescents, flower pots, vinegar jugs and tin cans, plain and ornamental.

The spirit which prompts this lavish outlay of time and material is commendable, but the same amount of labor and material would produce twice as many nesting boxes if the efforts were directed along practical lines. The absence of suitable nesting sites has induced many birds to accept the substitutes offered by man: a fact greatly instrumental in increasing our bird population. The success met with in the initial attempts brought about a great demand for nesting boxes, which induced business men to venture into the bird box game commercially. Their products are in evidence everywhere.

The types, while differing considerably in design and workmanship, however, are easily grouped into two classes, one known as the Von Berlepsch bird box constructed from hollowed-out logs and the other as the square type made of boards. The Von Berlepsch box is by far the more attractive, fitting into its surroundings inconspicuously and naturally. E. H. Forbush, however, claims that this type has been a failure with him, offering as a solution that it may prove more successful in other localities where birds seem to show a preference for this style. Any pattern used by the birds in a locality is likely to attract other birds to the same neighborhood. Here in Rockford (Ill.), the Von Berlepsch box has been found the favorite nesting box with the birds.

The needs of each species of birds has been met by well studied, simple, practical, roomy, sanitary and safe nesting boxes. The proportions of these have been painstakingly worked out by authorities on bird life and little or no improvement can be made except as individual fancy may dictate. The Von Berlepsch box can be bought so much cheaper than one could make it that measurements on this type will be omitted.

Materials for the square box type are more easily obtained and its construction is so simple that by following a few important rules any one is in a position to turn out very satisfactory houses. Labor being the greatest item of expense, the lumber should be selected with a view to its lasting qualities. Weathered lumber is to be preferred to newly planed boards and a coating of paint well dried in, especially if applied in the fall, will be no detriment.

Lumber less than $\frac{5}{8}$ -inch in thickness should not be used and boards $\frac{7}{8}$ -inch thick for anything larger than a wren box are preferable. The board forming the back of the box may project four inches above and four inches below the box proper. This permits of a secure and easy fastening to pole, building or tree. The roof should have a slope toward the front of two inches, with a projection of three inches over the front of the box. By placing the entrance hole one and one-half inches below the overhang, the roof will act as shelter against driving rains and also prevent cats and squirrels from reaching the nest from the roof. The two sides should reach to but $\frac{1}{8}$ -inch of the sloping roof, giving much needed ventilation to stifling nestlings. The board composing the front of the box must be considerably roughened or grooved both inside and out to give the birds a chance to climb in and out. Projecting bottom boards and perches must be entirely omitted. They offer foothold to bird enemies, enabling them to annoy and drive away rightful tenant. The bottom board should be perforated with gimlet holes for drainage from entering rains. The entrance, carefully corresponding in size to the size of the box, may be incircled with a zinc collar to prevent woodpeckers and squirrels from enlarging the opening.

A hinged roof, fastened with a small hook, will be found a great convenience. It greatly facilitates ejecting undesirable tenants, bird enemies, cleaning out old nests or nest photography. A hinged roof is not desirable where boxes are exposed to public abuse and covers fastened down with screws or dummy nails should be given the preference.

The merits of the many substitutes used in place of lumber, such as cigar boxes, gourds, jugs, tin cans, tarpaper, flower pots, will not be discussed here. They are makeshifts at the best, though they often serve their purpose. Anything worth doing is worth doing well, and greater enjoyment is commensurate with greater effort. Farmers' Bulletin No. 609, "Bird Houses and How to Build Them," publishes a practical list of the various boxes with full dimensions of house size of entrance and distance to be placed from the ground. This list is so complete that it is offered here for the benefit of the reader.

Species	Floor of cavity, inches.	Depth of cavity, inches.	Entrance above floor, inches.	Diameter of entrance, inches.	Height above ground, feet.
Bluebird	5 by 5	8	6	1½	5 to 10
Robin	6 by 8	8	(1)	(1)	6 to 15
Chickadee	4 by 1	8 to 10	8	1½	6 to 15
Tufted titmouse	4 by 1	8 to 10	8	1½	6 to 15
White-breasted nuthatch	4 by 1	8 to 10	8	1½	12 to 20
House-wren	4 by 1	6 to 8	1 to 6	7s	6 to 10
Lawick wren	4 by 4	6 to 8	1 to 6	1	6 to 10
Carolina wren	4 by 4	6 to 8	1 to 6	1½	6 to 10
Dipper	6 by 6	6	1	3	1 to 3
Violet-green swallow	5 by 5	6	1 to 6	1½	10 to 15
Free swallow	5 by 5	6	1 to 6	1½	10 to 15
Barn swallow	6 by 6	6	(1)	(1)	8 to 12
Marsh wren	6 by 6	6	1	2½	15 to 20
Song Sparrow	6 by 6	6	(2)	(2)	1 to 3
House Finch	6 by 6	6	1	2	8 to 12
Phoebe	6 by 6	6	(1)	(1)	8 to 12
Crested flycatcher	6 by 6	8 to 10	8	2	8 to 20

Flicker	7 by 7	16 to 18	16	2½	6 to 20
Red-headed woodpecker	6 to 6	12 to 15	12	2	12 to 20
Golden-fronted woodpecker	6 by 6	12 to 15	12	2	12 to 20
Hairy woodpecker	6 by 6	12 to 15	12	1½	12 to 20
Downy woodpecker	4 by 4	8 to 10	8	1¼	6 to 20
Screech owl	8 by 8	12 to 15	12	3	10 to 30
Sparrow hawk	8 by 8	12 to 15	12	3	10 to 30
Saw-whet owl	6 by 6	10 to 12	10	2½	12 to 20
Barn owl	10 by 18	15 to 18	4	6	12 to 18
Wood duck	10 by 18	10 to 15	3	6	4 to 20

(1) One or more sides open.

(2) All sides open.

By applying the fundamental principles of construction, as outlined above, one cannot go wrong in providing a simple, practical home for his bird friends. The size of the wren house, as given above, is somewhat large; a box 4x6 will be found more than sufficient. It matters little if the box is made vertical or horizontal, the bird's nest will always be found farthest from the entrance.

Any one who has watched the tiny bird in its endless, tedious task carrying in the material for the nest foundation, only to be confronted with the alternative of seeking a new home or cleaning out the old for its second brood, will gladly remember to build large enough, but not too large.

As much depends upon proper placing of a bird house as upon proper construction, the greatest error is made in placing too many boxes for a given area, which always sets the bird to quarreling, excepting the companionable swallows and martins. Boxes for a certain species are best placed at least one hundred feet apart. Dense woods and trees are generally to be avoided. A tree trunk is a highway of travel for flying squirrels, chipmunks, squirrels and cats. However, boxes suspended from a limb by a wire overcomes this objection and homes for wrens, nuthatches, chickadees and woodpeckers may be placed about shade trees and orchards. Extensive experiments have clearly demonstrated that nesting boxes placed on poles are preferred by the birds. These poles may be cat and squirrel-proofed by a two-foot strip of galvanized tin, six feet above the ground. Pergolas, porch pillars and buildings often offer desirable and safe location for bird boxes.

The entrance of the box should be placed opposite to that of the prevailing winds, which in Illinois are mostly from the southwest.

Equal in importance to proper construction, dimension and placing of a bird house is the strictest vigilance over its occupant. Close observations and bi-monthly examinations will often reveal such tenants as mice, chipmunk, flying squirrel, squirrel or English sparrow. These bird enemies are responsible for the greatest part of all failures in successfully attracting birds. The success attained by individuals will be measured by the amount of intensive protection accorded. Cats also must be dealt with relentlessly. No sensible person will expect to reform this animal instantly by an unkind word, cuff or severer punishment after considering that its impulses are those of countless ages and its diet of birds date back almost to the beginning of time.

Nesting boxes with openings of one and one-half inches and upward will ever remain the legitimate prey of the house sparrow. I have found it expedient to place many of these boxes in low down and convenient places for the sparrow's own use. A little observation soon records the home life of each and when the female bird has been brooding her eggs for two days, no disturbance will induce her to leave. This is the logical time to act; the male usually nonchalantly taking the place of the defunct female within half an hour immediately meeting the same fate. The box is then cleaned out ready for the next victim. At one time I took six males before the wily female fell a victim. The house sparrow is persistent, adopting abandoned

eggs or young with frequency and mating alternately time and again as one or the other falls a victim. This method of duping them has helped to relieve the martin colony from their unwelcome attentions and never more than one or two birds a season have preferred the disputed martin house to an undisputed home of their own.

HINTS ON THE CARE OF YOUNG PLANTS

It is not all in growing young plants to sow them in flats, pots or other receptacles. That is just the beginning of your work, and the least interesting side of it. The real pleasure to the garden lover comes when they are of a size to require handling, by which is meant thinning, transplanting and watching to prevent their growing unsightly and out of proportion. Means must be taken to prevent the young plants becoming too "leggy," as it is a desideratum in plant growing, of all but the vining kinds, to keep them short and stocky. To do this they must be kept at the proper temperature so that the stalks are not unduly forced ahead of their age, and just the right amount of moisture given or withheld. In addition to this they must be thinned out at the right time or they will try to overreach one another and get tall and spindling.

One of the reasons that individual treatment makes the finest plants is because a plant is no better than its roots, and to get a good root system should be your aim in handling them if you expect to get the extra fine results which alone are worth working for. When a plant is forced to grow short and stocky it at the same time develops its root-mass, which is the life of the plant. The theory in this is that a certain root-mass can provide for just so much plant after it has reached maturity or while producing that for which you are growing it—edible seeds, roots or tubers or top, as the case may be. With a large root-mass you should be able to get the maximum of finished product, while with a small one you may get little or none.

Root-hairs on plants are the fine feeding roots by which the plant absorbs moisture and its content of plant food. For it must be understood that a plant feeds by absorbing all its food in solution. It cannot take into its economy any plant food in a dry state. All must be dissolved in water in the soil and be absorbed through these fine root-hairs.

There is also a mechanical reason for transplanting young plants of those kinds which we desire to grow short and stocky. In the act of transplanting we break off a large number of the young root-hairs already produced which remain behind, and these in the new location branch, just as does the limb of a tree, making a vastly larger number and increasing the size of the mass in this manner. Much of the lack of success with this class of plants is due to the fact that they are not thinned out early enough. The tendency to spindle, once started, is hard to counteract, and on this account the best gardeners transplant early, before this tendency has gotten under way. Keep them just ahead of the tendency to spindle and you will have no trouble on this account.

When transplanting keep in mind that the roots of the young plants are growing umbrella-wise, and do not set them in their new locations with the root-mass all bunched, but try to set them spread out as they were before, so that the soil will pack around all of them, as contact with the soil is necessary for each rootlet, or it cannot feed or drink. When potting it is best to hold the young plant in the pot, and sift dry soil in around the roots until the pot is full, press gently down, and water to settle the soil.—*The Countryman*.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

The Garden

WITH the passing of the deep snows we have experienced during the past Winter much damage is being revealed, by mice and rabbits girdling trees and shrubs, and in some cases vines on wall, have fallen victims. In our own observations grape vines, Privet, Climbing Roses, and English Ivy have been the most accessible; fruit trees coming through almost unmolested. Reports however indicate that a vast amount of damage has been done by these pests.

In the case of small trees and shrubs they are readily replaced, and orders for such should be forwarded forthwith. With large trees it is more difficult; they are not so easily duplicated. In many cases it may be possible to save them by bridge grafting, but simple as this operation may appear from printed instructions, yet it is no undertaking for the inexperienced. It is work for the expert, and where a tree can be saved in this way it is worth many times the cost.

Where the Winter or dormant spray has not yet been applied to fruit trees and shrubs infested with scale, no time should be lost in getting this work done. It is not a pleasant job in itself, but it has to be done and done well to be effective. Of those who are applying Lime Sulphur solution a little care in doing the work is needed. This solution is not a poison in the sense that arsenate of lead is. It has caustic properties, however, which may prove injurious both internally and externally if due care is not exercised. Keep on the windward side of the spray as much as possible, avoid leaking hose, nozzles, and shut-off. The hands should be protected by a pair of good rubber gloves, and the face with vaseline.

Selecting and Preparing Seed Potatoes.—The stimulus given to home gardening during the war, and the ever soaring H. C. of L., is likely to result in larger plantings than ever before of the "humble spud," yet it not infrequently meets with but scant consideration when it comes to selecting and treating the tubers for planting. With the home grower whose sole purpose for planting is home consumption, there is generally nothing but culls rejected from the kitchen to select from, which are as a rule small stock. These, however, are by no means to be shunned for seed purposes if they were properly matured when dug, and are free from disease. Smallness due to prolonged drought, or poor culture will not materially affect the yield from such seed, but wherever practicable potatoes of average size should be selected, and as uniform as possible.

The treatment of the tubers against scab, and Rhizoctonia, should never be omitted. The benefits from such treatment are beyond the experimental stage. Organisms carrying diseases are carried through the Winter on tubers infested with the disease of the past season only to again infect the new crop. One pint of 40 per cent formalin to 30 gallons of water is effective against scab only, while 2 ounces of powdered corrosive sublimate to 15 gallons of water will deal effectively with both diseases. Wooden vessels only should be used, and the potatoes may be allowed to remain in the formalin solution two hours, one and a half hour being enough for the corrosive sublimate treatment. Both solutions may be used several

times. Tubers require to be thoroughly dried before planting.

The size of the seed piece has long been a debatable question, and one sometimes hears of crops of potatoes raised from planting peelings, but the practice of eating the potato and planting the skin is not likely to become general yet, even for home consumption. For general purposes a seed piece weighing about two ounces, and containing not more than two eyes is very satisfactory. The pieces should be short and thick rather than long and thin as they retain the moisture better.

Our ennui after a long and protracted Winter is liable to cause Spring enthusiasm to overrule prudence, and (although most of us know better) we are anxious to get out and make a showing. Preparation of the soil is the first step towards success, but unless it is dry enough to crumble as it leaves the spade more harm than good is likely to accrue. In soil that will crumble when dug there is not much difficulty in making a fine seed bed, but if wet when turned over it will lie heavy, and in lumps, which will dry off so hard that when it is raked it will be full of hard pieces that will not break up readily even when rolled. It is of course an advantage to get the ground turned over some time previous to sowing, since then it has a chance to settle and fill up any open or air spaces underneath.

In laying out the garden plot plan to have the taller growing crops at the north side of the lower growing one, so as to avoid any unnecessary shade being cast over them. A measuring stick is also indispensable for measuring the distance between the drills. Lay off the distance from the boundary fence where the first drill will come, mark the spot with a label, and do likewise at the other end of the plot. One may strike a pretty straight line with the eye, only to discover when the young plants are breaking through the ground that the line was far from being as straight as it was intended to be. A garden line the length of the plot is a good investment, attach it to a couple of good stakes, sharpened at one end, and you can stretch the line as taut as you wish. Then after giving it a snap to insure straightness drawing out of the drill may be proceeded with.

Beginners oftentimes find themselves the source of much amusement to the older hands at gardening in their first attempts at making drills, but go ahead undaunted, remembering the while that they too had to learn the art of opening drills. A hoe, plant label, or the handle of the garden rake may be used in making the drills, remembering that small seeds like lettuce, radish, onions, turnips, etc., require shallow drills, while peas are sown in wide drills, made by holding the side of the hoe against the line, and opening the drill the width of the hoe. Potato furrows are usually dug or plowed out, but on the small home plot they can be conveniently made on a small scale with either spade or hoe. Special seeding machines are now available, with any number of attachments which make them useful for cultivating the ground after seeding is completed. For the home garden these machines are a valuable asset, not only in the economy of labor, but in saving seeds. Used according to instructions sent with them, there is little loss from too deep or shallow planting as there is an adjustment

for each kind of seed, which ensures planting being done at the right depth.

There is also an adjustment for planting in hills, which only adds to the value of this modern implement for amateurs with limited time to devote to the garden.

Seed sowing by hand is an art, mastered only by actual and repeated practice. The even distribution of seeds, in sufficient quantity, so that the row is full and regular, leaving no blank spaces and reducing thinning out to a minimum, should be the aim in all seeding operations. Use enough seed to ensure a good stand, but don't be extravagant.

When seeds are sown too thick the plants are drawn and weakly from lack of room to develop properly. Large seeds such as peas are sown broadcast in the drill, using a gentle sweeping motion. Beans are sown by dropping the seeds from the hand at intervals of 3-4 inches. A good practice with beans is to plant in double drills, which is simply a single row along each side of a wide drill. Lettuce, radish, onions, turnips, kohlrabi, carrots, beets, spinach, etc., may be planted by holding the package in the hand, and controlling the amount of seed dropped by the thumb and fore-finger.

This type of seed may be sown as fast as one can walk in the stooping position necessary when doing this work. The closer one can get down to the drill with the hand the less likelihood will there be of the wind blowing the seed away. Always label each row after sowing, marking down the date, and another year you can use the label for reference when planning the garden.

In planting don't make the mistake of assuming that because you have included early, intermediate, and late varieties of vegetables in your list that these will give an uninterrupted supply throughout the Summer. In order to have vegetables in prime condition at all times frequent sowings are necessary of many types. Vegetables that may be had from one sowing include Lima beans, Swiss chard, egg plants, peppers, tomatoes, parsnips, squash, onions, muskmelons, parsley, leeks, New Zealand spinach, cardoon, oyster plant, potatoes, artichokes, rutabagas, cabbage, cauliflower, and celery, are sown in early Spring for Summer use, and again in Summer for Winter use. As soon as the frost is out of the ground, and weather permits, lawns should be raked, and any uneven spots leveled up and reseeded. Mulches round trees, shrubs, roses, and on the herbaceous and bulb beds should be removed. In many cases where manure is used for mulching it may be well dug into the ground, but the greater part of the fertilizing elements have long since passed into the soil with the melting snows.

Any new planting or re-arrangement of herbaceous plants should be proceeded with as weather and opportunity permit. The sooner this work is completed the better chance will the plants have of becoming established before the hot weather overtakes them.

In the flower garden the first thing to plant should be the sweet peas. Mark off the ground two feet wide and the length of the plot, and double dig this, i. e., dig two spades deep, and put in plenty of well rotted manure, and after it has settled a day or so plant the seeds very sparsely so there will be no overcrowding later. It will hasten the germination of the seeds considerably if they are soaked in water for 48 hours previous to planting. As the ground gets dried out and warmed up, hardier varieties of flower seeds may be sown, as Asters, Marigolds, Nasturtiums, Centaurea, Candytuft, etc. These may be sown where they are to flower, but much earlier and better results are to be obtained by planting in a specially prepared seed bed in a cold frame or mild hot-bed.

The Greenhouse

All is activity in this department. Seedlings of all kinds are coming along, and need more room and pricking off, so as to have a chance to develop into stocky plants for bedding out. Many of the Winter flowering plants are past their best, and they may as soon as practicable be thrown out, and preparations made for replacing them. Young carnation plants that are to be given outdoor culture before going into permanent flowering quarters may well be accommodated in a cold frame to harden off for some time previous to planting out. Geraniums and other bedding plants with the longer days and increased sun heat are taking on renewed vigor, and will need more space.

As good a place as any for many bedding plants, and especially geraniums, at this time is a mild hotbed. The bottom heat, moisture, and being close to the glass seem to suit these plants better than the hot dry greenhouse bench. Even with the most careful watering, on bright warm days, the pots if at all exposed on the bench (as they will surely be if they have enough room to grow properly) will dry out and the soil become heated, a condition that does not encourage growth much. A little later in the month it will not even be necessary to make up an hotbed. With a little banking round the frames, and careful manipulation of the sashes in the afternoons so as to run up a good sun heat, it is possible to maintain a fair temperature overnight even if the mercury does get dangerously near the freezing point. Careful watering and ventilation at the proper time are about all they will need in the way of attention.

With the warmer weather here to stay, it is advisable to leave a crack of air on the rose house overnight, and especially so on the modern type of houses which are almost air tight. It may be necessary at times to carry a little fire heat to keep the temperature where it ought to be, but there is little excuse for letting any of the fires out with the first few bright days. Bank the fire on bright mornings, but by all means run a little heat around at night. A cold raw night is bound to be experienced occasionally, and mildew once established will take more effort to oust it than the attention necessary to keep the fires going. Moreover rain, wind and fog not infrequently experienced during April is not conducive to the welfare of the young plants that are to replace the older ones, without a little fire heat to maintain a genial atmosphere.

Syringing should be attended to now that the plants will dry off quickly. With hard firing the greater part of the Winter and none too many opportunities for syringing, red spider will have found a haven somewhere, and he must be dislodged or the plants will suffer, particularly the young ones.

Those who failed to get the sod heaps together last Fall should lose no time getting this work under way, when outdoor conditions permit. Palms and ferns will need to be shaded now. The direct rays of the sun each day more powerful will soon cause permanent disfigurement in the form of burnt leaves. Any repotting or topdressing of these subjects should be pushed ahead with all possible speed. Established plants will be benefited by bi-weekly applications of liquid manure and soot water.

Specimen plants of Hydrangeas, that have been stored away should be brought out and given a top dressing, removing as much of the old soil and dead wood cut out as possible, retubbed if necessary. The same thing applies to Bay trees as far as topdressing or retubbing is concerned.

A Lesson on Transplanting

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

PROPER TIME FOR TRANSPLANTING

While under certain conditions, trees and shrubs may be transplanted every month in the year, and although for a number of permanent subjects Autumn is preferable to Spring, yet there is no doubt that in the more northern parts of the country, more transplanting is done in April than in any other month.

Although it should not be considered impossible to avoid any loss in transplanting, it is improbable that loss will be entirely eliminated, and when it does occur it is generally due to want of care in the actual carrying out of the operation, or to some neglect in treating the plant previously to its commencement.

Success in transplanting depends upon proper care and treatment during the several stages a plant has to pass through from the earliest moment of its life until it is placed in the position it is to occupy permanently for the remainder of its existence.

UNDERLYING PRINCIPLES INVOLVED IN TRANSPLANTING

The underlying principles involved in transplanting are the same whether we consider them in reference to a large tree costing several hundred dollars for the transplanting alone, or in reference to a cabbage plant.

High class growers of plants always keep their stock in the best condition for transplanting by frequently moving them about in the nursery, or by root pruning, which cause the plant to produce a mass of fibrous roots close to the stem, instead of roots of a long straggling character which must always be seriously damaged when the plant is lifted. The most important thing about plants is their roots, and success or failure in transplanting depends almost entirely upon what is done, or upon what is left undone, in respect to them.

Stock properly treated in the nursery or seed bed costs very much more to produce, and is cheaper at a comparatively high price, than low-priced stock which has been allowed to take care of itself, and has had nothing done to it from the time it was first set out in the nursery until it is dug up for shipment. Not only is the risk of transplanting properly cared for plants reduced almost to vanishing point (provided subsequent treatment is right), but stock of this kind receives little or no check to its growth; while low class stock, if it lives, practically stands still for a greater or less length of time, which, in some connections, may amount to years. Badly grown and stunted plants—however well they may be afterwards treated—never reach the same degree of perfection as those which have from the earliest moment of their lives lived under the best conditions.

After so caring for a plant, which is destined to be transplanted, in such a way as to reduce the shock of the operation, the next step is the digging of it up from the position in which it has been growing. In this the ideal to be aimed at is to avoid destroying or mutilating any of the roots, and to further prevent any of them being killed by the action of the sun and wind drying them out. Then it is possible to still further reduce, or ruin, the chances of a plant recovering from the shock of removal, by allowing the roots to be exposed to drying out influences after unpacking, or otherwise, while waiting for holes to be dug, &c., and this stage presents another opportunity for reducing the plant's vitality and its chances to recover from the operation, if it recovers at all.

CORRECT METHOD OF TRANSPLANTING

The manner of planting has considerable influence for good or evil. If roots are crammed into a hole several sizes too small, only a limited proportion of them can begin to recommence their functions. Room should be given for the roots to be spread out at least to their fullest extent, but also the wider the ground is broken up beyond the roots the better, as this enables them to grow and spread more easily.

Depth of planting is an important consideration. Some things, such as shrubs, roses, cabbage plants, may be planted deeper than they stood in their previous positions, as they will throw out new roots from higher up their stems; but trees should not be set out more than two or three inches deeper than they were before. Planting at an excessive depth renders the roots liable to suffocation for the want of oxygen. Thoroughly firming the soil around the roots is necessary for proper root action to take place. Sometimes the method is adopted in the case of a considerable amount and spread of roots, of keeping a hose going over the soil as it is filled in around them so as to be sure of

having all the spaces among the roots thoroughly full of soil, and in any case a good watering is essential. Care must be taken to always leave a few inches of fine loose soil at the top so as to allow air to enter.

While many plants are allowed to die for want of water subsequent to transplanting, it is at the same time possible to kill by overwatering. This latter is most liable to occur in connection with a clayey or undrained soil, as if the surplus water cannot drain away and the soil remains water-logged for any length of time, conditions will be created which will again be liable to cause the roots to be suffocated.

It will be seen that a plant may have to pass through the hands of several different persons in its progress from the nursery to its permanent position, and if one fails to do the right thing, the correct methods of the remainder are nullified. Obviously where all the stages are in the charge of one individual who understands the work, the chances of success are immeasurably increased. When all the circumstances connected with transplanting are under one control, failures, while not impossible, become extremely rare.

Too frequently during the course of transplanting, plants are subjected, as individuals, to the same treatment as one would give to a fence post. The fact should be recognized to its fullest extent that a plant is a living organism, and that transplanting at its best is more or less a violent operation which inflicts a shock upon the plant's system. In addition to what previous preparation may be necessary to that end, the great aim should be from the moment we commence lifting a plant, to reduce the violence of this operation to as near vanishing point as possible. As pointed out above, the part of a plant which is most directly affected by the operation is its roots, and the less the amount of care exercised in the work the greater the amount of roots, especially the more important younger ones and the root-hairs, which will be destroyed.

FUNCTIONS OF ROOTS TOWARDS TRANSPLANTING

It appears worth while to briefly consider roots, and the part they play in a plant's life.

We saw last month that as soon as a seed begins to germinate a root emerges from the seed-case and commences to grow down into the soil, this is known as the primary root. As growth progresses this root sends out branches which ramify through the soil. Plants have also the power of sending out roots from other parts of the stem above the point at which the shoot was originally attached to the seed, this can easily be seen in the case of corn, for example. Also parts of plants lying on the ground, as in the case of trailing vines and unstaked tomatoes, will emit roots, and the forming of new plants from cuttings is only successful when the cuttings form roots.

Roots have two functions, one being to anchor the plant to the soil, and the other to supply the plant with food and water. The plant's food is always dissolved in the water taken up by its roots, and it can feed in no other way. Not only is moisture in the soil necessary before roots can absorb plant food, but moisture encourages and excites root growth. Cuttings of many plants will quickly form roots when immersed in water, provided oxygen is present.

Like all other parts of plants, roots are composed of cells which are full of protoplasm. As protoplasm cannot exist in a living state without oxygen, and since roots grow by the continual formation of new cells, roots must have access to the oxygen of the air or they can neither grow nor live. We can easily prove this by placing a slip of any plant which will root in water, such as a willow cutting, into a jar containing water that has been boiled for ten minutes or so to drive out oxygen and then cooled quickly. After the cutting has been put in, pour over the water enough salad oil to form a film to exclude oxygen. Insert another similar cutting into a jar of water without oil and place them both in a warm room. In a few days roots will start freely from the cutting in the jar of which the water has access to the air but not in the other. We can carry the experiment further by placing the rooted cutting in the water from which oxygen is excluded, when the roots will very soon die.

Almost immediately roots are formed, hairs grow out from them. These root-hairs are of the utmost importance as almost the entire water supply and all food are absorbed through these hairs. Each hair is really a single elongated cell and is filled

with protoplasm. Roots do not grow throughout their entire length, but only by the addition of new cells at their extremities; that is of course excepting that growth in size which takes place as the roots increase in age. As the extremity of a root advances through the soil new root-hairs are formed in front of the older ones, while those farthest back are continually dying off, so that only a comparatively short portion of the rootlet bears hairs at any one time, and only the youngest roots are active in the work of sustaining the plant's life. The part of roots from which the root-hairs have perished absorb very little water and are mainly useful in giving strength to the plant and acting as conduits for the transmission of fluids. The active part of any rootlet in supplying nourishment is therefore short, and it follows that the greater the number of living young roots covered with hairs the greater the amount of food and water a plant will receive. Root-hairs act in a dual capacity; not only do they absorb water and food, but they excrete waste products in the form of acids, principally carbonic, and these acids dissolve mineral matters in the soil, which, forming a solution with water, are taken up and used as food.

In examining roots we must not confuse rootlets which are as fine as hairs, with the root-hairs growing from these rootlets; the hairs cannot always be seen with the naked eye. Any one who has noticed the delicate and minute character of rootlets and their hairs will readily understand the necessity for careful handling during the operation of transplanting, and it will be equally plain why a finely pulverized soil is necessary for the best results, and why there is a total absence of active rootlets in the hard clods of badly cultivated ground. The better the soil, both mechanically and chemically, the greater will be the number of fine feeding-roots.

The tip of each rootlet is protected in its passage through the soil by a thimble-like covering known as the root-cap, which in some cases may be readily seen without the aid of a magnifying glass. The root-tip in advancing through the soil, which it does by the force of new cells being continually formed behind it, does not move in a straight line, but has a partially rotary and oscillating motion which enables it to take advantage of openings between the soil particles.

The vast importance to the plant of active roots cannot be overestimated, and want of success in transplanting is invariably due to something which has had an adverse effect upon them. The delicate nature of the rootlets and their hairs renders it scarcely possible to avoid damaging some of them, even with the greatest care, but when this care is conspicuous by its absence, great destruction ensues.

While the points stated as being connected with transplanting apply equally to all classes of plants, both small and large, there is naturally some degree of difference in their application, which so far has been more particularly to trees and shrubs. In connection with small, annual plants, both flowers and vegetables, there are a few points worth further consideration.

POINTS TO CONSIDER IN TRANSPLANTING ANNUALS

Things of a perennial nature, as trees and shrubs, will, if they live, in time recover from the shock of transplanting, and, while our efforts should be to make that time as short as possible, no permanent loss will occur should the period be somewhat extended. With annual plants the case is different, for time lost during recovery from the operation cannot be regained, and further, any considerable check, especially in the case of some vegetables will render them useless for the purpose desired. In some things a check as the result of transplanting has a more harmful effect than in others; or, to put it in another form, some species, such as cabbage, for example, will recover sooner from the shock of transplanting and afterwards grow to more or less perfection than others, like cauliflowers and celery, which are invariably rendered useless by any material check in growth.

It must be remembered that the "hearts" of cabbage, lettuce, etc., and the large, white "heads" of cauliflower are artificial productions, that is, their wild ancestors do not produce hearts, etc., and what they produce in these respects to-day is the result of many generations of cultivation and selection. While under proper conditions the garden types artificially evolved in response to changed conditions of life are hereditary, yet under other conditions they soon revert to their original forms, or at least prematurely run to seed. The original wild cabbage was in form very similar to the well-known weed, charlock, and like all other annual and biennial plants, its only object in life was to produce seed for the reproduction of its species. After this was accomplished, it died.

If not allowed to produce seed, many annuals under suitable climatic conditions become biennials or even perennials, and among true perennials more or less continuous flowering is obtained by the prevention of seed production, although when seed from the first flowers is allowed to form, any further crop of flowers does not usually result.

The natural tendency therefore of all plants is to produce seed and this tendency—which in the case of many vegetables is synonymous with the non-production of "hearts," etc., is always hastened by any check to growth by transplanting, drought, badly cultivated and poor soil. Even in those cases where the ultimate useful results, as in the examples of peas and beans, are the production of seed, yet the maximum is not achieved unless considerable growth is made first. When anything occurs in the life of a plant, such as check to its growth, which is liable to give it the idea that immediate death is possible, it will make every effort to reproduce its species by the production of seed at the earliest possible moment. This characteristic of plant life is taken advantage of in the case of fruit production by the use of girdling and root pruning to check growth.

As in the case of vegetable plants the production of seed is the last thing desired, we have therefore to obtain the best results, to handle them in such a way as to avoid check from any cause, and especially to render the shock of transplanting as nearly absent as possible.

GROWING PLANTS FOR TRANSPLANTING

In growing plants for transplanting the seed-bed should be in such a state of richness and lightness that root growth will be encouraged to the maximum extent. The latter is still further induced and the plants are also rendered more stocky, by transplanting—at this stage known as "pricking out"—three inches apart as soon as the seedlings have formed their second leaves. In doing this it is important, as in all other cases, not to *pull* them up, but to lift them with a trowel or piece of flatwood; pulling, even when the soil is light and moist, always destroys more or less of the rootlets and their hairs. It is a good plan to thoroughly water seedlings the day before transplanting, as this reduces possibilities of root injury as well as securing the maximum water-content of the plant. Future handling is greatly facilitated if this "pricking off" is done into flats, as then the plants can be taken to the place of final planting out without any disturbance.

Another plan is to use pots for the purpose and those made of paper are quite suitable; also by their means we can transplant things like melons, cucumbers and corn, which cannot with successful results be transplanted in the ordinary way from seed beds. With these latter the seed must be planted in the pots in which the plants are to grow previously to being set out in their permanent position. To save room two inch pots are sometimes used for things like cabbage and annual flowers, but three-inch ones are better, especially in the case of plants which must have the seeds sown in the pots.

Obviously cold frames, hot beds, or a greenhouse are necessary for the production of early seedlings, and the object to be aimed at is not to have the plants too forward, but in such a stage of growth that they will not become stunted for want of room before the conditions outside are suitable for placing them in their permanent position.

As above mentioned, it is important that the roots should be thoroughly moistened before transplanting, and in the case of pots, if there is any doubt about it, they can be set in a pan of water for a few minutes so as to be sure the ball is thoroughly soaked. Properly carried out, plants grown in pots receive no check and do not know they have been transplanted, and in the case of many things two or three weeks in time are gained over those from seeds sown outside.

PRINCIPAL POINTS TO OBSERVE

The main points to be observed in transplanting are: To give the plant such treatment before lifting as to place it in the best possible condition for removal.

To exercise the greatest care over the roots during all stages of the operation, and to see that the new conditions in which the roots are placed are such as to enable them to renew their functions at once, so as to prevent any check to growth.

Transplanting may result in one of three things; the plant may die; it may live but make little or no growth; or it may thrive. Unless the latter is achieved we cannot claim absolute success for the operation.

Referring again to ornamental things used in gardens for their landscape effects, it almost goes without saying that the beauty of home surroundings as a whole is brought about not only by seeing to it that the happiness and thriftiness of plants is secured by successful transplanting but also by continual care year after year. It is also equally obvious that in addition to giving the individual plant conditions and treatment which will enable it to develop fully its intrinsic beauties, it should be so associated with plants of other species that the entire picture produced by a combination of different plants should be at all times pleasing, and that flowers will be in evidence from early Spring until late Autumn, to say nothing of brilliant berried effects during the Winter.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

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D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.
M. C. EBEL, *Secretary*, Madison, N. J.

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Peter Duff, Orange, N. J.; William Waite, Rumson, N. J.; Arthur Smith, Elberon, N. J.; Robert Weeks, Cleveland, O.; William H. Griffiths, Detroit, Mich.

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(To serve until 1921)—William N. Craig, Brookline, Mass.; William Hertrick, San Gabriel, Cal.; William Gray, Newport, R. I.; G. Hennenhofer, Great Falls, Mont.; Thomas Hutton, New London, Conn.; Albin Martini, Lake Geneva, Wis.; A. C. Jordahn, Palm Beach, Fla. (To serve until 1922)—George Wilson, Lake Forest, Ill.; James Stuart, Mamaroneck, N. Y.; William Kleinbein, Orono, Pa.; John F. Huss, Hartford, Conn.; Edwin Jenkins, Lenox, Mass.; Carl N. Fohn, Colorado Springs, Colo.; Joseph Tansey, Tuxedo Park, N. Y. (To serve until 1923): Robert Williamson, Greenwich, Conn.; Robert Cameron, Ipswich, Mass.; Theodore Wirth, Minneapolis, Minn.; George H. Pring, St. Louis, Mo.; George W. Hess, Washington, D. C.; Daniel J. Coughlin, Locust Valley, L. I.; John Barnett, Sewickley, Pa.

GARDENERS' CONFERENCE IN NEW YORK.

A conference of gardeners was held under the auspices of the National Association of Gardeners on March 18th in the Engineering building, New York City. Robert Weeks of Cleveland, ex-president of the association, presided. The conference was called to give the members an opportunity to discuss the aims of the association, and the operations of the Service Bureau, and to formulate plans for a campaign to interest young men in the profession of gardening.

W. N. Craig of Brookline, Mass., presented a communication from the Massachusetts Horticultural Society, directing attention to Quarantine Bill No. 37, and its detriment to horticultural progress in the United States, and asked that a delegate be appointed to represent the organization officially at a meeting to be held during the month of May, at which various horticultural interests are to be represented. The association voted to be represented at this meeting.

Following the meeting of the association, a statement was issued to the New York papers by an unidentified source, evidently with malicious intent, that the association had gone on record as in favor of the exclusion act, preventing the importation of plants. This, of course, is an untruth, as the National Association of Gardeners from the first has been strongly opposed to Quarantine Bill No. 37, and the discrimination now practised by the Federal Horticultural Board in favoring those who have been friendly to it, while discriminating against those who have had courage to express their views regarding the injustice of this measure, is not weakening the opposition to it of the professional gardeners.

The workings and immediate future plans of the Service Bureau were explained and generally discussed by the members from the floor, following which a motion was carried heartily endorsing what has been accomplished by this department of the association.

Alexander Michie, chairman of the Service Bureau Publicity Fund, made a strong appeal for greater support on the part of the members towards this fund, so that the work may be carried out which has been planned. His appeal met with immediate response among many of those present who came forward after the meeting to subscribe to the fund.

The discussion regarding the possibility of interesting young men in the profession of gardening drew forth optimistic expressions from most of those who spoke on the subject, while a few were rather pessimistic in their views of the success of bringing young men into the gardening profession, while other vociferous appear to be offering so much more lucrative advantages. It was regarded, however, by all present that the gardening profession is confronted by a serious problem at the present time, due to the inability to secure young men as assistants, and it cannot look forward as in the past to Europe to supply them, for among the ranks of young men of the profession who entered the war, the sacrifice of life was a heavy one.

The relation between the employer and the gardener came in for considerable discussion, with opinions about equally divided that both were blameworthy for the lack of confidence existing between them.

Meeting of Trustees and Directors

At an executive meeting of the trustees and board of directors of the association held earlier in the day, at which W. N. Craig of Massachusetts, Robert Weeks of Ohio, George W. Hess of Washington, D. C., John Barnett of Pennsylvania, Robert Williamson of Connecticut, Joseph Tansey, James Stuart, Daniel Coughlin of New York; Arthur Smith, M. C. Ebel of New Jersey, were present, the recommendation of the last convention that the 1920 annual meeting be held in St. Louis was favorably acted upon. The secretary was authorized in conjunction with

the committee appointed at the last convention, to develop plans immediately to bring the advantages that the profession offers to the attention of young men who may be interested.

A communication was received from President L. P. Jensen of St. Louis regretting his inability to attend the meeting and the conference, owing to new development work which he has just undertaken in connection with his position, and containing a number of recommendations which were acted upon by the executive board. President Jensen wrote that he would be glad to receive suggestions from officials and members of the association, bearing on its welfare and the profession which it represents.

W. N. Craig Addresses Garden Club of America

On March 17th, W. N. Craig appeared before the Garden Club of America at its annual meeting at the Colony Club of New York, and addressed a large audience composed of its members on the "Professional Gardener from His Viewpoint." Mr. Craig ably presented the cause of the professional gardener, and judging by the hearty reception his remarks received, his views met with the endorsement of those who listened to him. His address will appear in a later issue of the CHRONICLE. Mr. Craig also spoke of the inequities of Quarantine Bill No. 37 which met with general approval, the Garden Club of America passing a resolution unanimously as opposed to the measure.

SERVICE BUREAU PUBLICITY FUND.

The following contributions have been received towards the Service Bureau Publicity Fund up to March 25th:

Previously acknowledged	\$912.00
John F. Proctor, Wilmington, Del.	10.00
John Cumming, Tarrytown, N. Y.	2.00
Alexander Brown, Montclair, N. J.	10.00
Robert Weeks, Cleveland	10.00
Robert Mackie, Mt. Kisco, N. Y.	5.00
C. L. Paul Gabriel, Kansas City, Mo.	7.00
Robert Heggie, Bath, Me.	3.00
Harry Heslop, Adrian, Mich.	2.00
James Michie, Cold Spring Harbor, L. I.	5.00
Gustave Hamerin, Glen Cove, L. I.	5.00
Jerome B. Murphy, Elberon, N. J.	10.00
John G. Melrose, Long Island City, L. I.	10.00
Alphonse Chague, Lenox, Mass.	2.00
William Anderson, South Lancaster, Mass.	10.00
Luther B. G. Webb, Willoughby, O.	3.00
Theodore Wirth, Minneapolis	5.00
Peter Duff, Orange, N. J.	10.00
William Allen, Mamaroneck, N. Y.	5.00
J. H. Brunger, Riverdale, N. Y.	2.00
Alexander Mackenzie, Smithtown, L. I.	5.00
George G. Milne, Hot Springs, Va.	5.00
George Wyness, Prides Crossing, Mass.	5.00
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T. D.	5.00
M. J. Pope, Nantuxuck, Conn.	5.00
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John E. Taaffe, New Canaan, Conn.	2.00
Charles Trambels, Bernardville, N. J.	5.00
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J. L. Porter, St. Davids, Pa.	5.00
George L. Stewart, Waltham, Mass.	3.00
H. Ernest Downer, Northampton	3.00
Alexander Reid, Buffalo	5.00
J. W. Everett, Glen Cove, L. I.	5.00
Harry Jones, Port Chester	2.00
T. F. Eastwood, New York City	5.00
A. G. Ross, Bridgeport, Conn.	5.00

A. A. Leach, Yonkers, N. Y.....	\$5.00
Frank Luchenbacher, Yonkers...	7.00
J. J. Connolly, Mt. Kisco, N. Y..	5.00
Roy Donald, Yonkers, N. Y.....	5.00
Robert Bottemley, New Canaan, Conn.	5.00
M. W. Reid, Augusta, Ga.....	2.00
Ernest Wild, Madison, N. J.....	2.00
A. L. Marshall, Greenwich, Conn.	5.00
John R. McCulloch, Oyster Bay, L. I.	15.00
Fred Humphreys, Jericho, L. I..	5.00
William H. Sansom, Huntington, L. I.	3.00
Stanley Jorden, Waterford, Conn.	3.00
Total	\$1,164.00

AMONG THE GARDENERS

Albert H. Laine, for the past two and a half years gardener to Mrs. H. M. Hanna, Jr., Willoughby, Ohio, has been appointed gardener to Mr. Warren Bichnell, Cleveland, Ohio.

Robert Cochrane, formerly of Valley Ridge Farm, Mt. Kisco, N. Y., has accepted the position of gardener on the Bradley Martin Estate, Westbury, L. I.

Herbert Stuart, formerly of Larchmont, N. Y., has accepted the position of gardener on Long Beech Farm, Gull Lake, Augusta, Mich., the estate of H. B. Sherman.

George Alcock, formerly of Chappaqua, N. Y., has secured the position of gardener on the estate of Miss M. M. Newall, Bedford Hills, N. Y.

Nicholas Talb has accepted the position of gardener with Benson B. Sloane, Cedarhurst, L. I.

Gustave Hamerin, formerly of Glen Cove, N. Y., has accepted the position of gardener to H. D. Roosen, Greenlawn, L. I.

John D. Wilson, formerly of Greenwich, Conn., secured the position of gardener on the estate of H. H. Dow, Midland, Mich.

Charles Swain secured the position of gardener to Mrs. M. Perkins, Chester, Mass.

Theodore Chase has accepted the position of gardener on the estate of Miss Marshall, Williamsburg, Va.

Charles Miller accepted the position of gardener to Miss G. Arentes, Dumbarton, Va.

John David Boyd, formerly of Newport, R. I., has accepted the position of gardener to J. E. Barbour, Paterson, N. J.

Paul Powers, formerly of Suffern, N. Y., has secured the position of gardener to Mr. Charles Sherman, Oyster Bay, L. I.

William Barron secured the position of gardener on Prospect Farms, Maplewood, N. J.

Alexander Michie, for the past number of years superintendent of the Henry Sanderson estate, Oyster Bay, N. Y., resigned that position to accept a similar one on the Childs Frick estate, Roslyn, N. Y.

William Allen secured the position of gardener to Leroy Frost, Nyack, N. Y.

Paul Hamer has secured the position of gardener on the T. Tower Bates estate, Convent, N. I.



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READING, ENGLAND

Alexander Sherriffs, formerly gardener on the Mrs. F. S. Smithers estate, Glen Cove, N. Y., secured the position of superintendent on the Henry Sanderson estate, Oyster Bay, L. I.

Felix Woods has accepted the position of gardener to Mrs. F. S. Smithers, Glen Cove, N. Y.

James Bell, well known among the gardening fraternity in the Eastern states, and who for the past several years has been superintendent of El Pomar, Broadmoor, Colorado Springs, Colorado, died on March

18. Mr. Bell, who was an ex-president of the National Association of Gardeners, is survived by his widow and two sons.

Charles Ernest Carman, who, while assisting in laying out the grounds for the soldiers' memorial at Washington, contracted a severe cold and returned to his home at Lake Forest, Ill., recently died there. Up to about a year ago Mr. Carman was employed as foreman in charge of construction work under Thomas W. Head, superintendent of Melody Farm, Lake Forest, Ill. Mr. Carman is survived by his widow and a young child.

LOCAL SOCIETIES

THE PENNSYLVANIA HORT. SOC.

A large audience attended the illustrated lecture of this society on March 16th on "Perennials and Bulbous Plants," by E. I. Wilde, assistant Professor of Floriculture at the Pennsylvania State College.

"You are gathered here this afternoon," said Prof. Wilde, "to be entertained, not by the speaker but by the flower friends which will be thrown upon the screen. Perhaps you have not thought of it in this light, but whenever I attend such a lecture as this, I always have a feeling of renewing such friendships, and a sight of my old favorites in their natural setting only intensifies my desire to be once more with them in my own garden."

"I like to consider the garden as a place of recreation, a place in which one may secure the necessary relaxation from the mental strain of the office, shop, or any daily toil; a beautiful spot where one may meditate in perfect quietude. Flowers demand our attention, for are we not all more or less sentimental? They are magnetic in their appeal to be better known and properly placed in our own old-fashioned gardens. *Old Fashioned Gardens!* I know no better name for all natural plantings of herbaceous perennials."

The lecturer then took his audience through the Out Door Garden, from April to November, starting in with the early flowering bulbs, giving all the material used in the perennial border, in the order of the flowering season.

"Those of us," he said, "who have only a limited space in which to grow flowers, have perhaps made the acquaintance of a few plants which are superior to those already in the bed. These are all individual problems applicable to your own garden. We should not, however, concentrate only on our flower problems. We should think of the other fellow's garden and help him to straighten out his perplexities. Every home should boast of a few of these perennial plants. Before we can realize this, people must be taught love for the beautiful. This can very readily be accomplished through individual effort or co-operative effort such as a garden club. This organization is doing a good bit in disseminating and awakening an interest in ornamental horticultural material. This garden movement is still in its infancy but gaining in momentum very rapidly, which is shown most clearly by the number of new nurseries which are springing up throughout the East and the advance of the industry in the West and Southwest."

The exhibits of plants and flowers at this lecture was the best we had this Winter season. DAVID RUST, Sec'y.

STAMFORD (CONN.) HORT. SOC.

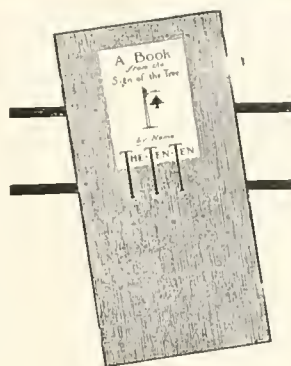
The regular monthly meeting was held March 6. Four new members were elected and 12 nominations for membership received. The society gave its moral support to the Association of School Teachers of Stamford for increase of salary. The fact is too well known that teachers are underpaid for their very important profession and many a teacher is leaving it for a better paying one. The future of mankind and of this country depends largely on good teachers. Bolshevism has no show among well-educated people. The name chosen for the new hall is "The Stamford Horticultural Hall," and subscription by the members alone amounted to close to \$8,000. The

outlook is that the society will take possession of its new home by April 1. Papers for the incorporation of the society have been sent to Hartford by its attorneys, Bertram and Mead. G. C. Boon, Cor. Sec'y.

ST. LOUIS ASSN. OF GARDENERS.

The regular monthly meeting was held February 29, with President L. P. Jensen in the chair.

E. D. Miller and A. Huber, of the Orchid Department of the Missouri Botanic Garden, lectured on "The Western Culture of



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Orchids." Colored lantern slides were used to illustrate the various phases of the work peculiar to their adaptations, including potting, fumigating, atmospheric conditions, watering, overhead spraying by the Skinner system, and potting media. Mr. Huber's experience covers a period of eight years in the orchid houses at the Missouri Botanic Garden, and Mr. Miller's, both American and European. Two resolutions were read by the president: The Government Quarantine Order of the Orient, etc., and the Unfair Methods of Transportation Through the Rocky Mountain National Park. Upon motion, the club unanimously adopted the said resolutions protesting stopping importations and the misuse of transportation privileges at the Rocky Mountain Park.

G. H. PRING, Cor. Sec'y.

NASSAU COUNTY HORT. SOCIETY.

The regular monthly meeting was held on March 10. President Thomas Twigg occupied the chair. Joseph Böhler was elected to active membership and two petitions for active membership were received. James McCarthy, James MacDonald and John F. Johnstone were appointed a committee to secure judges for all coming shows. A letter of sympathy was sent to Ernest J. Brown, treasurer of the society, on the recent sudden death of his wife. A letter of congratulation was sent to Alex. MacKenzie, a member of the society who recently took unto himself a wife. William Goonan gave a practical talk on "Bees and Bee-keeping," which was very interesting and from the number of questions Mr. Goonan answered there seems to be a lot of bee or intending bee-keepers in the society.

ARTHUR COOK, Cor. Sec'y.

TUXEDO (N. Y.) HORT. SOCIETY.

The regular monthly meeting was held on Wednesday evening March 3, a large attendance of members being present, with Edward Wilson in the chair. The ladies' annual night will be held on April 7. The late Mr. MacMechan was declared the winner for the monthly exhibits of the past year.

JAMES DAVIDSON, Sec'y.

NORTH SHORE (ILL.) HORT. SOC.

The above society held its regular monthly meeting on March 8. The smoking concert proved a success. Ralph Clawson was elected auditor for the coming year. It was announced that Mr. Scott, of La Grange, will give a talk on "Landscape Gardening," and Mr. Fitzhugh, of Lake Forest, will tell us how to build a root-cellar at our next meeting.

Considerable discussion arose about cultural certificates for the members, and it was voted to buy a lithographed plate and have same printed.

J. R. CLARKE, Cor. Sec'y.

WESTCHESTER (N. Y.) AND FAIRFIELD (CONN.) HORT. SOCIETY.

The regular monthly meeting was held in Greenwich, Conn., February 13, with President John Andrews presiding. Two new members were elected to membership. P. W. Popp gave a very lengthy discourse about the coming flower show which is to be held in New York City. Oscar Addor, in a very stirring address, spoke on the present labor crisis and general conditions prevailing throughout the country. Since our last meeting two of our prominent members have passed over to the "Great Beyond" in the persons of James Foster and John Harper. Mr. Foster was an expert in all branches of horticulture and a keen exhibitor at our monthly meetings.



Keep Your Garden In Perfect Condition All Summer— Water It the Easy Skinner Way

Are you going to take a chance again this summer on having dry weather spoil the results of all your skill as gardener?

You know, from bitter experience in the past, how discouraging it is to have a crop ruined just as you have brought it almost through to harvest time.

All those weeks of work, spent in growing plants and cultivating them—with nothing to show for it in the end. And of course it's unpleasant to explain any such occurrence to the "boss," no matter how reasonable he may be.

So you see what a load the certain, swift, easy Skinner System of watering takes off your mind.

"Rain when you want it"—Just turn a valve, and there's a gentle soaking shower, that will wet the soil down for inches, and yet won't pack it. Or spatter anything with mud. Skinner rain is so fine and mist-like that it won't injure even your flowers in full bloom.

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MAMARONECK, N. Y.

His pleasing personality was well known to the gardening fraternity. Though they have passed from our midst, both will live long in the memories of those who were fortunate enough to be classed among their friends JACK CONROY, Cor. Sec'y.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you tell me the best way to start seed-raising on a commercial scale? I have been raising seeds for years. I do not know where to buy envelopes for seeds or any of the material.—W. B., Minn.

Some information on the above may be gathered from the following publications of the U. S. Department of Agriculture, Bureau of Plant Industry, Washington, D. C.: "Vegetable Seed Growing as a Business," Year Book, Separate, 512. "Saving Vegetable Seeds for the Home and Market Garden," Farmers' Bulletin, 884. Also from a book written and published by Charles Johnson, Marietta, Pa., "The Seed Grower." Packet envelopes and bags may be obtained of Brown Bag Co., Fitchburg, Mass., and Robert Gair Co., Brooklyn, N. Y.—A. S.

Here and There

RENAMING GERMAN IRISES.

Editor—I have just noted in your February issue a quotation from *The American Botanist* on "Renaming German Irises." It appears in your column "Here and There," on page 76.

I heartily agree with the unnamed author on the absurdity of renaming irises for the reasons mentioned, but he makes a statement which must certainly be challenged. It reads: "* * * we may point out that the reason certain irises are called German irises is because they are derived from a species of Central Europe, named *I. germanica*." This may or may not be true.

The varieties in the trade today which show any relation to *I. germanica* are very few indeed. Amas, Kharput, Siwas, Purple King, etc., may be mentioned, and these are for the most part geographical variations of a species which, if I remember correctly, does not occur wild in Germany in spite of its name. With these must be grouped the varieties like Oriflamme and other derivatives of Amas. But these last are the results of pollen crosses (probably of Amas), for with the exception of Kharput all the true germanica irises have proved pod-sterile with me and with other breeders whose work I know.

There is, therefore, no reason for abandoning the common name, "German Irises" for so-called patriotic motives, but there is ample ground for doing so on the botanical side, since *I. germanica* (the species) is sterile in the majority of its forms and has a small group of derivatives and progeny in the trade. On the other hand, the Irises, *pallida* and *variegata* (both species), and their natural hybrids have an enormous number of descendants to which are now being added hybrids with *I. trojana*. Since the botany of the genus *Iris* groups all the iris species into sections according to their relationship, and since the names of the sub-groups are of

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The flowers frequently measure from four to five inches in diameter and range in color from cream-white, lemon, clear yellow, soft salmon-pink, to bright red and deepest crimson, and there are also light lavender and sky-blue shades, and more charming rare "pastel" and art shades in wonderful combinations of rose, pink, salmon and amber.

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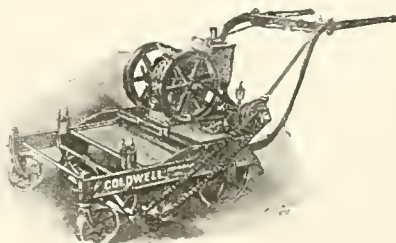
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interest and are pertinent, it seems to me highly desirable that they be adopted. Both *Iris germanica* and *Irises pallida* and *variegata* fall in the same group—*Pongoniris*—the group of bearded irises, because of the conspicuous lineal beard in the "falls." And the names "Tall Bearded Iris" and "Dwarf Bearded Iris," which are being adopted by some nurserymen, represent no fanatical attitude, but one based on botanical ground.

"Liberty Iris" is of course beneath attention, but I am sure you do not wish your paper to chronicle a viewpoint as inaccurate as that of your exchange.

B. X. MORRISON.

THE UPKEEP OF OUR PARKS.

Editor:—Referring to the article, "Decay of Public Parks," in your February issue, not until we give to our superintendents, gardeners and farmers the wages that are paid them in other trades can we expect them to follow the professions of Horticulture, Floriculture, and Farming.

The knowledge is not acquired in a few days, but takes years of hard work, long hours, and training. For a remuneration much less than common laborers we cannot expect to be able to keep our estates, farms, gardens and parks in proper condition.

FREDERICK J. MICHELL, JR.

WATER FOR FOWLS.

Who has not witnessed a beautiful song bird hiding in the shade of the densest available foliage with bill wide apart, feathers ruffled and wings drooping, panting for breath in the merciless heat of Mid-Summer?

This is a common enough sight, especially in communities lacking in streams, ponds and lakes. Fresh water is an absolute necessity to our avian friends in the Summer months and a necessity which we can supply with little effort on our part. Even in localities fortunate in having lakes or streams nearby, the water question is frequently a matter of life or death with the birds, and more especially the young birds who cannot fly the great distance back and forth often enough to appease their thirst.

No unnecessary expense need be undergone in providing bird baths and fountains. They will partake as freely and as thankfully of the water in a cheap earthenware or enameled or graniteware pan as from the most ornate product of the sculptor's art. If possible, set the pan in the shade and at some elevation. The shade will help to keep the water cool part of a hot day at least, and the elevation will keep it clean and free from the intrusion of dogs and cats. A shelf nearby will come in handy for the birds to alight on and preen and dry their plumage after the bath. This can be placed in the direct sunlight. If pans are used over two inches deep, place a flat or shelving slab of stone in them for the birds to alight on.

The pleasure to members of the household watching the antics of one jolly family of bluebirds disporting in the water will amply repay you for your efforts.—P. & R.

FLORAL LIFE FROM PAST AGES.

As a result of the deep trench digging and the blasting out of shell holes by high explosives during the war in Europe, northern France has produced some interesting floral results. Strange plants and flowers unlike anything heretofore known are growing on the battlefield. It is believed that this is a result of bringing into action of the sunshine and air, seeds which have remained deeply in the soil for many years.

An instance is reported from northern New Jersey, where in dredging a stream the materials excavated from many feet

Of Interest to Country Estate Owners

The National Association of Gardeners take this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

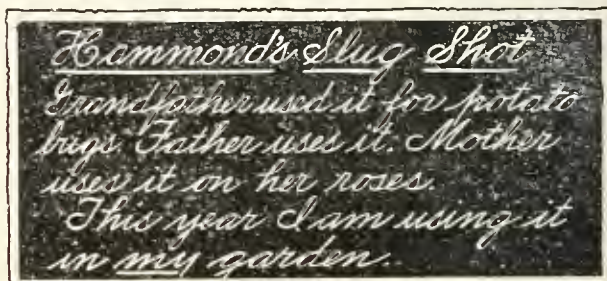
The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

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below the surface were scattered over the surface of neighboring fields. On these deposits an entirely different vegetation has started growth.

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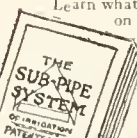
use the "Sub-Pipe" Irrigation System. It will make your garden produce a succession of crops all summer long—keep your lawn and shrubbery fresh and green until frost—when they would otherwise BURN UP from the summer heat.

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Just So is my opinion of the hardy chrysanthemum situation most illuminating. Every one who has received my Iris catalog knows that my claims are well founded. You will miss something if you do not get my hardy chrysanthemum literature; out about April 15th. Write for it.

H. W. GROSCHNER

Napoleon, Ohio

Hardy Chrysanthemum Specialist

It is interesting at least to know these facts, and it is hoped that botanists will make careful study of the plants thus produced. It is hoped that the strange plants may be classified, and the age to which they belong determined.

It is possible, however, that they may quickly succumb under present climatic conditions.—*Flower Grower*.

OF GENERAL INTEREST

U. S. BOTANIC GARDEN 100 YEARS OLD.

The United States Botanic Garden, Washington, D. C., will be 100 years old on May 8, for it was on May 8, 1820, that the use of five acres of land was granted by Congress for a botanical garden, and four years later, on May 26, 1824, the area of this grant was extended.

A botanic garden was among the first projects considered by President Washington for the federal city, and he discussed its location with the commissioners of the federal district.

Under the act of Congress of May 8, 1820, the Botanic Garden was started on the city square, where the patent office now stands. Here the greenhouses for the living plants brought to the United States by the exploring expedition to the southern hemisphere, 1838-'42, commanded by Capt. (late Rear Admiral) Charles Wilkes, were first located. Some of those plants are still living and many of the plants in the present garden are descendants of those brought to this country by the Wilkes expedition.

During 1820 the present site of the Botanic Garden was prepared under authority from the President.

The garden contains many historic trees, including one planted by Abraham Lincoln. The botanical collection received some valuable contributions from the expedition of Commodore Perry to Japan. An old date palm in the conservatory, which has repeatedly thrust its head through the skylights, was planted before the Civil War.

The office of superintendent was created in 1850 and the first incumbent was W. D. Breckenridge, who had been horticulturist and botanist to the Wilkes expedition. He was succeeded by William R. Smith, a devoted friend and admirer of "Bobby" Burns. Mr. Smith was superintendent for sixty years. George Wesley Hess, formerly connected with the Boston public gardens, and who has spent his entire life in the profession, has been in charge for the last seven years.

AMERICAN DAHLIA SOCIETY.

At the meeting of the Executive Committee of the American Dahlia Society, held at the International Flower Show, New York, March 19, it was decided to hold the Autumn Show in New York during September at one of the centrally located hotels.

The plan is to give the greatest Dahlia show ever held and work to that end has already been started and will be prosecuted vigorously and continuously until show-time. Every Dahlia grower and lover of this popular flower is invited to co-operate.

Let Dahlia growers everywhere, amateurs as well as professionals, begin now in the effort to make this the greatest exhibition of any single flower ever held.

EDWARD C. VICK, Secretary.

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THE SPRING FLOWER SHOWS.

The Spring Flower Shows held in New York City and Boston during the month of March proved all that their promoters anticipated, both from the point of beauty and as a financial success.

At the Seventh International Flower Show held in the Grand Central Palace, New York City, the Dutch bulb garden of John Scheepers and the rose gardens of A. N. Pierson and F. R. Pierson were again the outstanding features that they have been in the past shows. Comparison with previous shows is impossible as many of the exhibits of the former shows were missing, due to a large measure to the restriction of the importation of foreign plants, but to the laymen the attractiveness of the general lay-out of the show appeared no less than

THE FLOWER GROWER

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Terrell, Naturalist, Room Y 179, Oshkosh, Wis.

what he had witnessed at former events.

Much credit of the success of the show is due to the owners and gardeners of some of the private estates, among whom should be prominently mentioned, Adolph Lewisohn, John Canning, gardener; who carried off many first prizes; Mrs. F. A. Constable, James Stuart, gardener; W. B. Thompson, A. Strahan, gardener; Mrs. Payne Whitney, George Ferguson, gardener; W. R. Coe, Thomas Proctor, gardener. Other gardeners gave their welcome aid to a somewhat smaller extent by exhibiting in the scattered classes.

The Department of Parks of Manhattan and of Brooklyn exhibited some very interesting groups of plants from the metropolitan conservatories.

Joseph Manda created considerable publicity for the show with his new Brasso-Cattleya, which was named by Mrs. Woodrow Wilson, "Mavehona," and another new Cattleya to which he gave the name of "General John Pershing."

The trade was well represented both as to exhibitions in competition and with trade exhibitions.

While the expert could note the effects of the late war on the Spring flower show, which was resumed after a lapse of two years, nevertheless it was a most creditable showing, and the large attendance indicated that the New York annual Spring Flower Show had become well established in its popularity among the public.

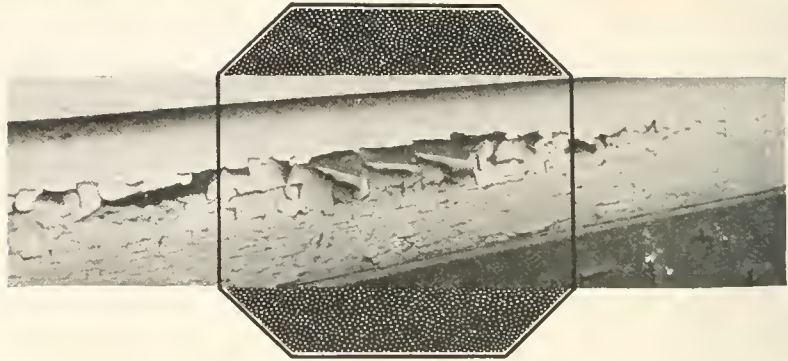
Boston's Orchid Show in which the Albert C. Burrage exhibit of orchids was the center of attraction has been declared the finest of any show of its kind ever staged. The general appearance was of tropical effect.

Aside from the orchids, another feature was a wonderful collection of some one hundred and thirty Kurume Azaleas, imported from Japan by the Arnold Arboretum. These flowering plants in their variety of colors made a beautiful display and were greatly admired by the visitors to the show from near and far.

An exhibit of rhododendrons from the Walter Hunnewell estate, Mr. Hatfield, gardener, and groups of flowering plants exhibited by Mrs. C. G. Weld, W. C. Rust, gardener; the Bradegee estate, W. N. Craig, gardener; Miss C. Warren, H. Stewart, gardener; were the prominent exhibits of the private growers.

Among the commercial growers, the exhibition of a large collection of Acacias by Thomas Roland; a group of orchids comprising over a thousand specimens of Cattleyas and their hybrids by Julius Roehrs Co. and the Farquhar exhibit were among the principal ones placed before the admiring visitors to the show for their inspection.

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How common it is to see round about the base of fruit trees of every description a young forest of superfluous and unnecessary growths which have been allowed to develop without ever making an attempt to check or rid the trees of them. A moment's reflection cannot fail to convince the beginner that such a state of affairs is most undesirable. To allow these basal shoots to develop in such an unrestricted way must be harmful to the trees and seriously menace their future fruitfulness. Plum trees are, perhaps, a more frequent source of trouble than most other subjects, bush fruits excepted, and where these trees

are growing in grass or on lawns, where they are frequently met with, they are a source of anxiety to the growers on this account.

The question naturally arises how to rid the trees of these innumerable and unnecessary growths. The merest novice should readily realize that to leave a tree thus unattended to must be prejudicial to its best interests, and for this reason it should be dealt with promptly. The first thing to do in removing suckers from fruit trees is to remove the soil round about the former and to cut off the suckers quite close to the roots whence they spring. It is useless merely to cut them off just below the surface.



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Water Lilies are certain to become more popular from year to year, as the erroneous ideas about them are cleared away. They are easy to grow, their requirements are quite simple, they are easily as beautiful as any garden flowers, yet they are comparatively rare.

My list includes all the standard varieties, together with several novelties of great interest in both tender and hardy classes. The stock of some hardy lilies is low, but we are well supplied with most of the tender lilies. Early placing of orders is most advisable.

My Booklet gives full varietal descriptions, together with cultural directions and many valuable hints. You can obtain a copy if you write at once; later the edition may be exhausted.

**WILLIAM
TRICKER**

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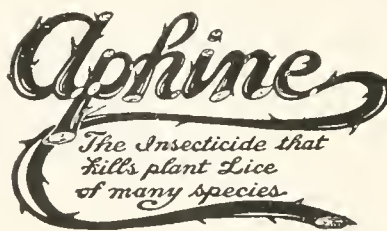
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FUNGINE—For mildew, rust and other blights affecting flowers, fruits and vegetables.

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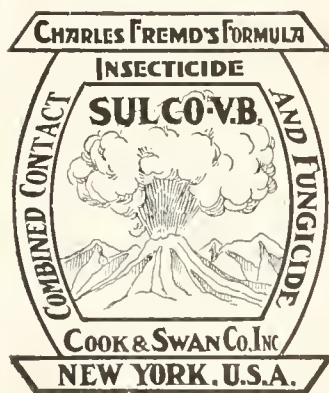
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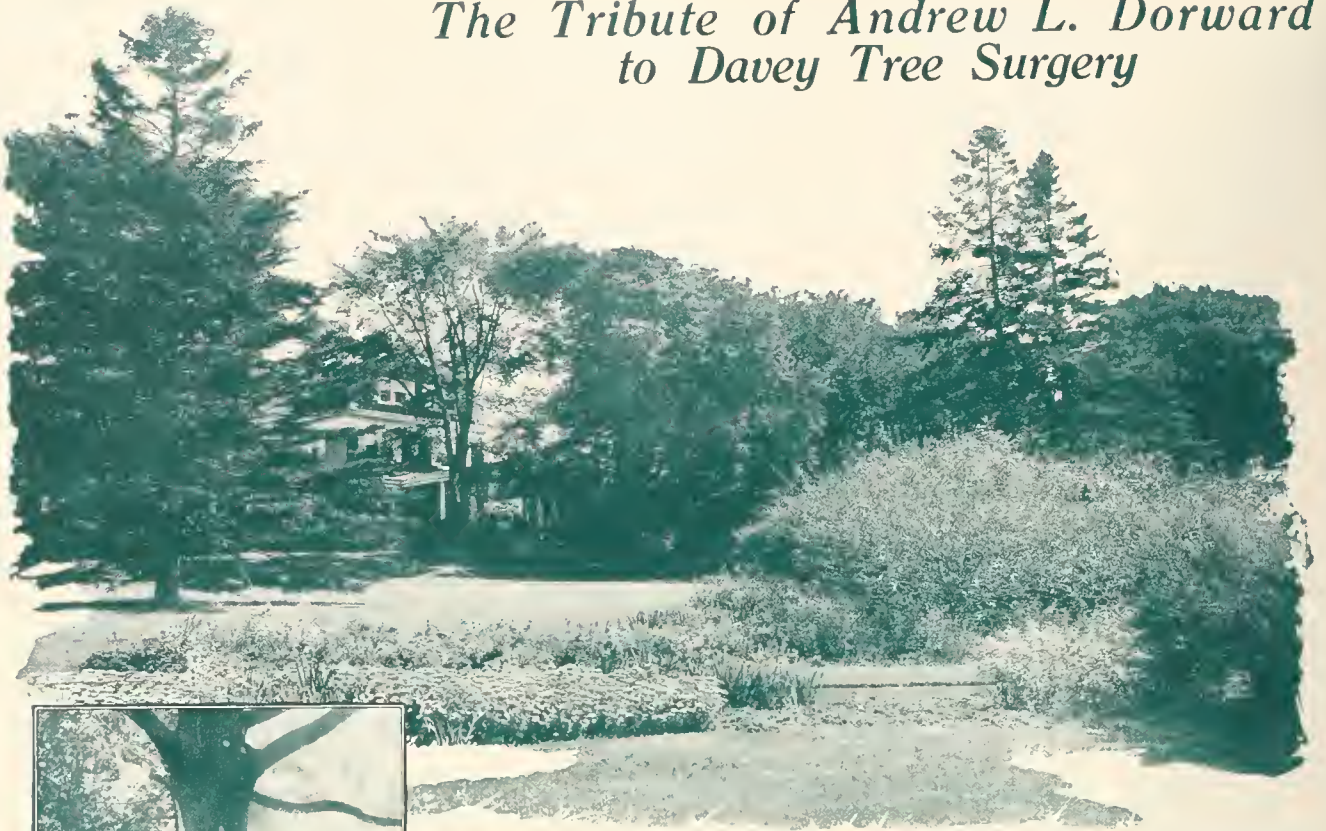
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(OF AMERICA)

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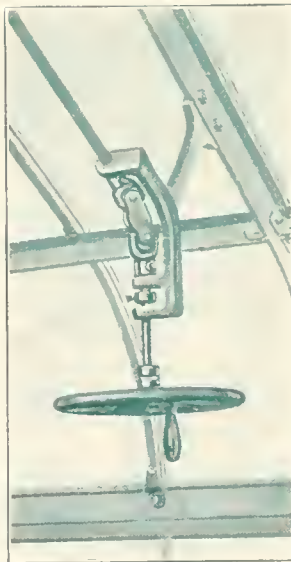
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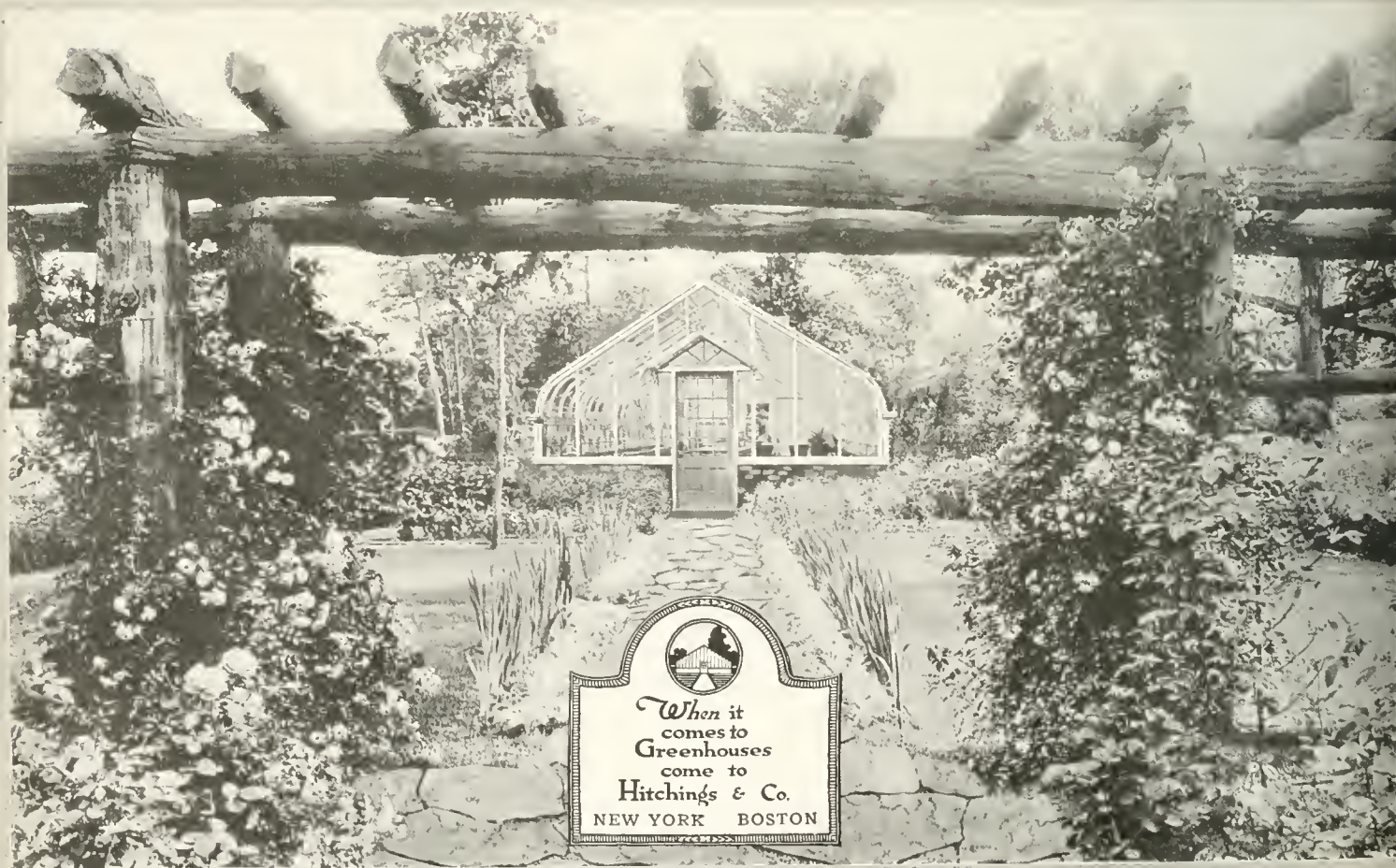
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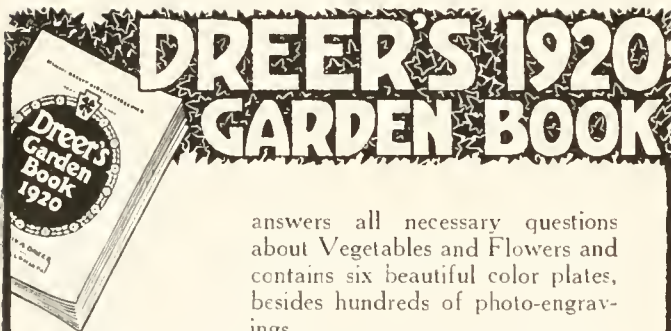
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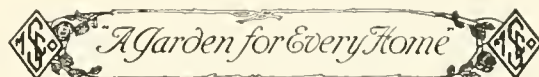
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MARTIN C. EBEL, Editor

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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

MAY, 1920

No. 5

Things and Thoughts of the Garden

THE ONLOOKER

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NEW YORK
BOTANICAL
GARDEN

UNUSUAL interest is being displayed in Orchids at the present time in many quarters by reason of the restrictions imposed on plant importations by the Federal Plant Quarantine Act of last year. As is so often the case, experts on the subject do not entirely agree as to the probable effect of this measure on Orchid culture in this country, some being inclined to think it has received a serious set-back, while others profess to believe that scarcely any inconvenience will be noticeable because of the large number of seedlings which will be raised. Undoubtedly the work of hybridizing and raising Orchids from seeds will be greatly stimulated. Enough has been done already to prove that here is a field which offers possibilities of fascinating interest. Money, time, and patience are the chief requisites, of which the last is by no means least when we realize that one must wait for five years and upwards for final results. A wonderfully instructive exhibit, showing the various stages and time required in the development of an Orchid from the seedling to the flowering stage, was that arranged for A. C. Burrage at the Boston Flower Show in March. It was a happy thought carried out to perfection and worthy of wide imitation. At this show, which will long be remembered for the high standard of excellence of the exhibits, as well as the unique displays of new azaleas, the Orchids were easily the leading feature. The wonderful collection of hundreds of varieties from the greenhouses of A. C. Burrage at Beverly, Mass., made a most remarkable display, and the efforts made to achieve a naturalistic effect represented a real triumph in the art of staging Orchids to advantage. It was an appropriate occasion on which to launch the National Orchid Association and this new organization we hope to see wax stronger and stronger as time goes on.

* * *

In spite of the fact that Orchids have been recently described by a government official as "a mere bagatelle" of the floral world, the Orchid family must still be regarded as one of the most important in the vegetable kingdom. Certainly no other has made such a fascinating appeal to what might be termed the popular imagination, which views this family through an atmosphere of romance and mystery. This has been partly created by the thrilling stories of the adventures and the perils which have been braved by Orchid collectors, together with the fancy prices at which some specimens have changed hands. But aside from all this we find in the Orchid family some of the most beautiful of Nature's products, showing not only a great variety in the color but also a marked individuality in the structure of the flowers. The plants, too, show a great difference in the size and habit of growth. The largest known is said to be *Gram-*

matophyllum speciosum with stout pseudo-bulbs as much as ten feet in length, a plant seldom seen under cultivation. The long climbing stems of *Vanilla planifolia*, from the fruit of which is extracted oil of vanilla, have been known to exceed one hundred feet in length, while at the other end of the scale are some kinds of very small stature, their ultimate height being measured in inches, of which the lovely *Sophranitis grandiflora* might be cited as an example. Their geographical range is a wide one, as they are found the world over except in the very coldest and the very driest regions. In the humid atmosphere of the tropics they flourish in the greatest profusion, many kinds attaching themselves by long adventitious roots to the trunks and branches of forest trees and obtaining most of their nourishment from the atmosphere. In fact the majority of Orchid species grow this way in their natural habitat and so are classed as epiphytes. Those which grow upon the ground, terrestrial kinds, are found mainly in the temperate regions. Several kinds are to be found in the woods of the northern states, mostly in the neighborhood of peat-bogs, though sad to say, they are fast disappearing from some localities because people cannot resist the temptation to ruthlessly uproot them when in bloom. Many a fine clump has been brought in from the woods in full beauty and planted in the garden with fondest hopes which were never realized. Loveliest of all the native Orchids, most would say, is the showy Lady's Slipper, *Cypripedium spectabile*. It is well worth a special effort to try and establish a clump of this handsome plant in the garden, though it must be admitted that it is not in every garden that a suitable place can be found. Given a cool shady nook and planted in a good deep pocket of "boggy" soil where the roots can keep moist and cool there is a fair chance of being rewarded with success, which in this case is sweet indeed. The right time to plant is when growth has finished for the season and the leaves have begun to fade.

* * *

At one time Orchids were considered exceedingly difficult plants to handle and a certain air of mystery seems to have been prevalent regarding the details of their culture. This undoubtedly arose because of the fact that in the early days of their introduction very little was known about them beyond the fact that they were natives of tropical countries. Those which came from the mountainous regions of those countries were treated exactly the same as those which flourished in the stifling heat of the jungle, and consequently many thousands were literally stifled to death in over-heated and ill-ventilated greenhouses. Naturally they were looked upon as plants which only the very wealthy could afford to

grow and that very special conditions and cultural skill were also indispensable. All that, however, is a thing of the past. From being the expensive luxury of a few wealthy enthusiasts, Orchids are now within the reach of any one who can afford a greenhouse. The cultural requirements of many of the most beautiful and useful kinds are now quite well understood and call for no more skill than is necessary for the successful handling of the general run of greenhouse stock. Of course, in the case of a big collection of Orchids wide experience and cultural skill of the highest order is called for, but that is beside the point just now. From these genera: *Cattleya*; *Laelia*; *Dendrobium*; *Cypripedium*; *Calogyne* and *Lycaste*, can be made a selection of beautiful species and hybrids of simple requirements.

* * *

There seems to be every indication that the need for the continuation of War Gardens, under the name of Peace Gardens if you will, is even greater than ever this year. With the farmers protesting against the Day-light Saving plan in the States where it is in force, on the ground that it interferes with their work and so will reduce their output; the scarcity of farm labor and the increased ratio of consumers against producers; the high cost of *everything* now, with the prospect of increased transportation charges, it would seem to be a wise move on the part of all who can possibly do so to grow at least a part of their food supply for the coming year. With potatoes selling now at four and a half dollars per bushel and talk of higher, and still higher next year, a bushel dug from the home garden next Fall will be worth two up in Aroostook County, Maine. Many who could grow this staple food crop have hitherto found it easier to buy, but this may be a year when the position will be reversed. Great anxiety is being manifested already in European countries over the potato crop prospects for this year, and if there is another shortage there, we may be sure there will be none to be given away here. Those vegetables which can be kept for Winter use are of the first importance, and time and energy spent in raising beans, cabbage, winter squash and the various root crops promises to turn out a good investment.

* * *

Nothing is more conducive to real happiness than the cultivation of a garden. "Every home a garden" is an ideal which if it could be realized would do much to sweep away the spirit of unrest and discontent so rampant, and which expresses itself in so many inconvenient forms. The word garden implies home and family life, the best safeguard of a nation, and those who take up gardening either as a hobby or as a profession stand a good chance of getting the very best out of life. Everyone rejoices in early Spring and seems to take on a new lease of life with the unfolding of the earliest buds and blossoms. It is then that the gardening instinct makes its strongest appeal and the sight and the feel of newly turned soil is one of the finest tonics. A garden affords both physical and mental recreation. As the season progresses and plants develop it will prove an increasing source of restful enjoyment and ever-growing interest. Trees and shrubs add to the permanent value of a place as well as being just ornamental, while the pleasure of gathering fresh flowers and vegetables for the table brings a sense of satisfaction that cannot be expressed in money values.

* * *

A tree of marked distinction in the landscape is the picturesque Red Birch, and to see a shapely specimen placed to good advantage on a lawn is to think of it ever after as one of the most beautiful of trees. The wonder

is that it is not more generally planted. As with all other Birches the branches are slender and graceful, giving it that light and pleasing form so much admired. In the Winter season it is specially attractive because of the beauty of the bark, reddish brown in color, which on the branches flakes and curls into thin papery layers, marking it as a tree of peculiar interest. In the wild it grows chiefly along river banks, River Birch being one of its common names, and it is therefore a suitable tree to plant in moist ground. Botanically it is known as *Betula nigra*, but in this case the specific name was not well chosen as another species is known as the Black Birch.

* * *

It is a well-known fact that there is something very fascinating about a water-garden and wherever the lie of the ground and other conditions permit of the inclusion of a stream or pond within the garden area it is a chance which should not be allowed to go begging. A combination of water-gardening and bog gardening can be made a most attractive feature. Plants which grow in the water possess a distinct charm of their own and the moist ground surrounding a natural pond permits of the use of moisture loving perennials, trees and shrubs to the fullest advantage. This of course is possible only on places of considerable extent, but because one has only a small garden it does not follow that we cannot grow aquatic plants. A hard-wood barrel will provide two good tubs in which can be grown some of the smaller growing water lilies, one plant to a tub, which looks best if set in the ground level to the top. Water lilies are very partial to rich soil and in this case the tub should be at least half filled with soil and planted in a sunny position. Two or three gold fish in the tub will add to the interest and incidentally devour any mosquito larvæ in the water.

OUR NEW DEPARTMENTS

In keeping with its policy of always giving its readers the most needed assistance and of being as practical as possible the GARDENERS' CHRONICLE takes pleasure in announcing two new departments which it is certain that its readers will receive with pleasure. They are departments unique among magazines devoted exclusively to the interests of gardeners and horticulturalists and departments that there has certainly long existed the need of—the department of Foreign Exchange, beginning with the June number, and the department of Book Reviews, which appears with this issue. The object of the former will be to give concisely to American readers the best suggestions of all kinds that can be derived from the study and the experience of the most proficient and authoritative gardeners and horticulturalists in the more progressive countries of the old world. The object of the latter will be not only to call attention to the more desirable of the new books but also to guide in the wise obtaining of them and in wise use of them.

For the conducting of these two new departments the CHRONICLE counts itself fortunate in having obtained the services of a man in whom is an unusual combination of the requisite qualifications. He has been from boyhood an enthusiastic gardener and student of plants and has had opportunities for study and experience in various parts of the country and under various conditions. In him are found, along with the advantages of study at several large American universities and acquaintance with foreign languages, practical acquaintance with the workings of one of the most prominent state agricultural experiment stations and of the national experimental farm, to which is added the benefits that have come from visiting prominent nurseries in this country and from travel in Europe. Throughout he will keep in mind the various classes of readers whom the CHRONICLE desires to serve.

Plan For Aunken Garden

M. ROBERTS CONOVER

A SUNKEN garden utilizes the declivity, the spot below the wall or bank which can be made beautiful by means of definite boundaries and plantings which emphasize desirable lines and mask those not in harmony.

The sunken garden may suffer some handicap from being entirely walled in. Unless some attention is paid to its arrangement with regard to ventilation, sunken gardens may not have breeze enough and be close and hot in very warm weather or damp and sultry if the weather be wet.

The garden here described aims to overcome these defects to a certain extent.

There are two points of appeal which must not be overlooked if the sunken garden is to be a success; one the view from higher points outside of the garden itself requiring that the garden be perfect in its design, furnishing and planting; the other is the prospect from the garden itself. In looking out of the sunken garden, one naturally looks up. Part of the charm of the sunken garden is the upward vista of charming outlines of trees against the sky, as a serrated outline of cedars, the graceful droop of elms whose upper portions are seen from the garden or

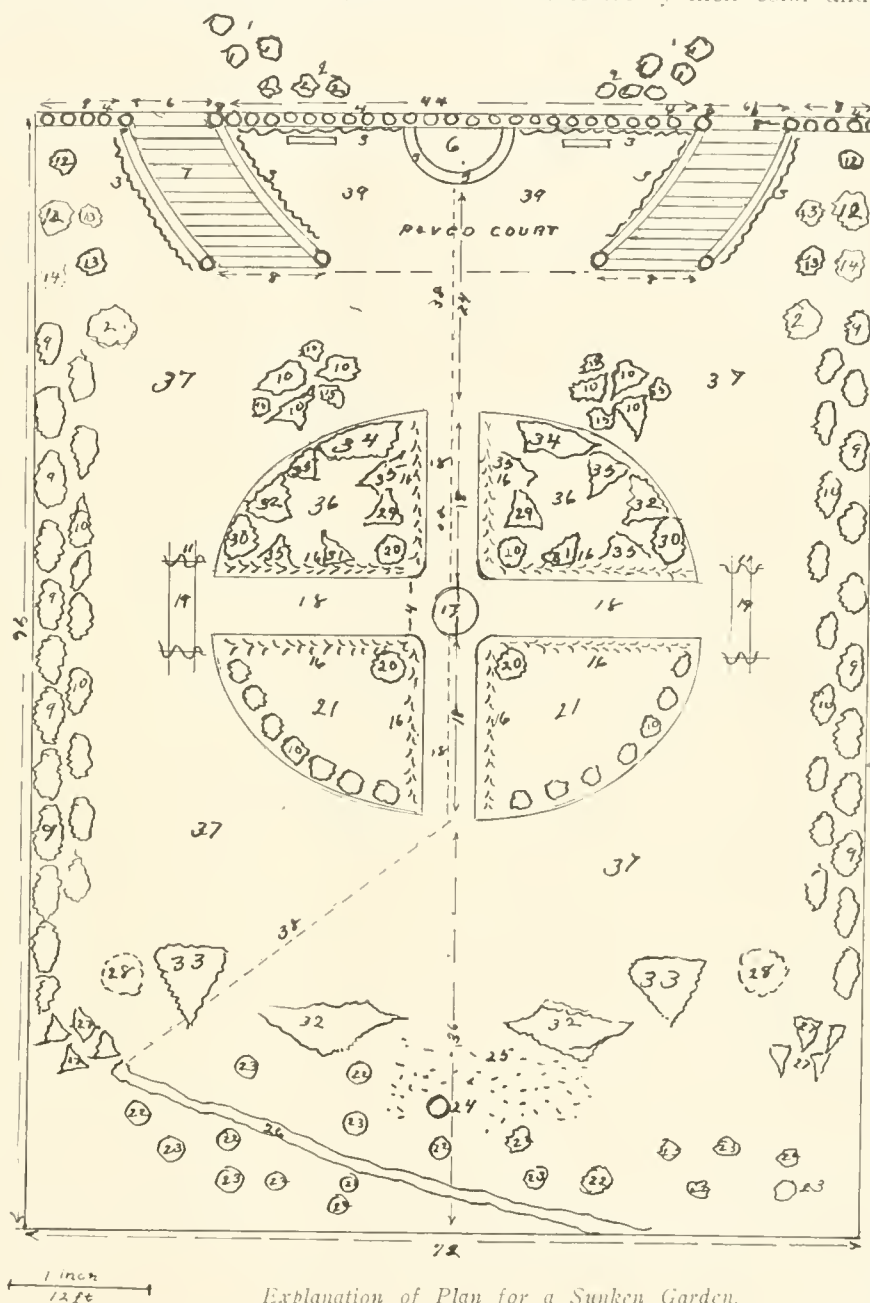
the variation in masses of evergreens and deciduous trees which interest by their color and harmony of arrange-

ment. The gleam of a white balustrade among vines or trees is lovely and gives a peculiar finish to the boundary of a sunken garden.

The more variety in the color and form relating to its boundary lines the less restraint one feels in the sunken garden. It is possible to treat the sunken garden in a very costly manner and have an effect which is oppressive and makes one feel almost a prisoner in a much decorated hole in the ground. The secret of success is in the treatment of its peculiar vista possibilities.

The garden described herewith is 72 feet wide by 96 feet long, with a depth of 6 feet at its walled end, the depth gradually diminishing toward the grove at the farther end. It lies in a hollow just below the lawns surrounding the dwelling and is entered by two flights of steps—these flights of steps curve slightly toward the middle of the space below.

A wall six feet high of brick with a white balustrade is constructed on the entrance side. This balustrade is set back about six inches from the face of the wall, and one seated in the paved area below has less of the sense of confine-



Explanation of Plan for a Sunken Garden.

- | | |
|---|---|
| 1. Cedars. | 20. Cedar <i>Glaucus Virginica</i> or hardy |
| 2. Blood red Japanese Maples. | Blue Cedar. |
| 3. Virginia Creeper (<i>Impatiopsis Vir-</i> | 21. Annuals. |
| <i>ginica</i>). | 22. Bilstead (Sweet Gum or Liquidambar). |
| 4. Balustrade. | 23. Swamp Maple. |
| 5. Pansies and Sweet Alyssum. | 24. Statue. |
| 6. Fountain. | 25. Ferns. |
| 7. Stairs. | 26. Brook. |
| 8. Lairs. | 27. Cedars—Red Cedar. |
| 9. Lombardy Poplars. | 28. Willow (<i>Salix Babylonica</i>). |
| 10. <i>Spiraea Van Houttei</i> . | 29. Flowering Almond. |
| 11. Roses. | 30. <i>Forsythia suspensa</i> . |
| 12. <i>Chionanthus</i> or Fringe Tree. | 31. Judas Tree or Red Bud (<i>Cercis Cana-</i> |
| 13. Japanese Snowball (<i>Lilburnum plica-</i> | <i>densis</i>). |
| <i>tum</i>). | 32. German Iris (Lavender and Purple |
| 14. Japanese Plum (<i>Prunus Japonica</i>). | variety). |
| 15. Yucca (Adam's Thread and Needle). | 33. <i>Lobelia cardinalis</i> . |
| 16. Japanese Barberry (<i>Berberis Thun-</i> | 34. <i>Rhododendron maximum</i> . |
| <i>bergii</i>). | 35. Peonies. |
| 17. Basin. | 36. Hardy or Perennial Phlox. |
| 18. Walks. | 37. Sod. |
| 19. Arbor overhung with Thousand Beauties. | 38. Line of water conduit. |

ment which a high wall gives in such a situation.

In applying this design to a smaller area it would probably be better to place the steps parallel with the wall, thus leaving no apparent break in the line of the balustrade and thus getting greater apparent width, or but one flight of steps could be used.

Large jars are used at either side of the flights of steps at the terminations of the balustrade.

The effect of this balustrade is greatly enhanced if a group of cedar trees are placed a few feet back of it near the steps on either side in the upper lawn. Nearer the balustrade are groups of blood-red Japanese Maples and the effect is very charming.

The breast of the wall is hung with Virginia Creeper, in Summer a restful green, in Autumn a glowing red. In fact, the autumnal attractions of this garden are conspicuous. The wall is toward the sun and the space between the flights of stairs is warm and sunny. This spot is protected from rough winds and the bright colors of the maples and bilsteads used in the grove and elsewhere make it warm with color in October.

Midway of the wall between the flights of stairs is a wall fountain. A basin below catches the fall of water. About its margin are planted pansies and sweet alyssum. This fountain-cooled space below the wall is furnished with seats and is a charming rest-place.

The overflow from the fountain is piped beneath the garden's level to the grove on its opposite side. This pipe runs down the middle of the garden to a basin at the intersection of the paths. From thence it follows the main path to its termination and then turns toward the side of the garden. Beyond the formal portion of the garden the water is released from its conveying pipe and

flows over a gravelly bed where it ripples away among the trees an apparently natural brook.

In the middle of the garden is an elliptical portion planted with flowering plants and shrubs and traversed by paths at right angles. If these plantings are kept low, the garden space will seem more expansive.

At the sides of the garden no wall is used, but the sloping bank on each side is rounded to a terrace-like curve and inclines gracefully downward to the level of the garden itself. Sixteen feet back of the side extremities of the elliptical portion and on the brow of the slope on either side are planted a row of Lombardy poplars. Before these on the inner sides next to garden a row of *Spiraea Van Houttei* is planted. This arrangement carries out the idea of inclosure and yet breaks the severity of its lines.

Midway of the garden on either side, opposite the transversing path, is an arbor overhung with a climbing rose.

The treatment of the opposite end of the garden is informal. A grove of bilstead or sweet gum and swamp maples, together with an evergreen group on either side, form the boundary on this side of the garden. Two specimens of the willow, *Salix Babylonica*, are also used.

On the margin of the grove directly in vista line with the main garden path leading from the balustraded wall is a statue. Ferns are planted in the space about its base and there is a planting of *Lobelia cardinalis* and another of German Iris.

Where this design is applied to a location having a different exposure, the kinds of plants used will have to be chosen according to the prevailing shade of the wall and trees.

Native Blue Gentians

BERTHA BERBERT-HAMMOND

TWO of the most beautiful of our native wild flowers that appear to be but little known excepting by name or poetical allusions, are the closed or bottle gentian botanically known as *Gentiana Andrecesii* and the fringed gentian (*Gentiana crinita*).

The closed or bottle gentian resembles somewhat in shape and habit of growth, the *Phlox maculata*. The foliage is of a pleasing bright green and its flowers that appear at the top of its tall erect stems in rosettes or clusters are of the deepest blue at the top, blending to a lighter blue at the base. These large bud-like flowers are not only beautiful but extremely interesting because they possess the unusual and peculiar characteristic of never really opening; that is they remain closed like a bud, or "bottled up," hence probably the common name. The closed gentian which may be found from August until November, in marshes or along the borders of moist meadows or woodlands, is a hardy perennial and endures transplanting, but its less common and more beautiful relation, the fringed gentian is not only more difficult to domesticate but is also less easy to find. Indeed, it is most elusive as it actually changes its hiding place from year to year. My "springy" meadow is a favored haunt: still each Autumn must I tramp about this four acre tract seeking to locate these shy blossoms that I know are somewhere concealed. For ages, poets have extolled the violet, but for modesty, the fringed gentian is its equal.

In color this dainty retiring flower is of the purest cerulean blue—truly not unlike a fragment of sky come down to earth, and in form it is molded along perfect, classical lines. The artist's "line of beauty" twice re-

peated ({}) describes its vasselike outlines and correctness of proportion. A more beautiful flower it would be difficult to imagine. All those who know this rare flower in its haunts, or have had the good fortune to see specimens, are most enthusiastic in its praises. The fringed gentian delights in rather moist meadows or "woody" locations and comes into bloom in this section (southern New York) about the middle of September. As William Cullen Bryant so aptly and beautifully expresses it in the following stanzas:

Thou blossom bright with Autumn dew,
And colored with the Heaven's own blue,
That openest when the quiet light
Succeeds the keen and frosty night.

Thou waitest late, and com'st alone,
When woods are bare and birds are flown,
And frost and shortening days portend
The aged year is near his end.

Then doth thy sweet and quiet eye
Look through its fringes to the sky,
Blue—blue—as if that sky let fall
A flower from its cerulean wall.

The pity of it is that this floral treasure is so rare and appears to be less frequently seen than in former times, also that most attempts to transplant it to perennial gardens have proved unsuccessful. Then, too, with the encroachment of civilization, this shy flower has receded and so is seldom found anywhere near centers of population. Its late-blooming habit, which often prevents its seed from reaching full maturity, is also a potent factor in the threatened extermination of this exquisitely lovely wildling, whose habitat is over comparatively a restricted area of North America.

The Herbaceous Calceolaria

HENRY J. MOORE

THE *Calceolaria* derives its name from the Greek *Calceolus* which means a little slipper, the flowers somewhat resembling the latter article of footwear. The common name of the plant is "Slipperwort." The herbaceous *Calceolaria* is one of the most glorious of the greenhouse decorative subjects. It is, however, sadly neglected on this continent, as probably not more than two ounces of seed are sold in the United States and Canada, and that chiefly imported.

There is no country in the world where the subject can be grown to greater perfection than ours. No subject which gives better returns for the work put into its culture. What then is the reason it is not more generally grown? It flowers from early March until the end of May in the greenhouse, and when removed to the living rooms will last from two to five weeks. It causes admiration wherever exhibited, and yet for some reason is shunned by Florists and Gardeners. What is the trouble?

The writer is an enthusiastic *Calceolaria* grower, and would like to see the subject generally grown and exhibited, to replace the many inferior and common flowering ones which with the *Calceolaria* do not favorably compare. When packed closely in boxes or crates, the subject may be shipped long distances, although in some quarters this is not the opinion. For the past nine years extensive experiments have been carried out in the Greenhouses of the Queen Victoria Park, which have demonstrated all that is claimed in the preceding text.

Sowing the Seeds: Sow the seeds during June for an early batch for flowering in large pots, or during September for a late one in smaller pots. Prepare the seed pans carefully. Afford good drainage in the form of crocks. Upon these place a layer of siftings such as fibres or particles of leaf soil, then a layer of soil sifted through a $\frac{1}{4}$ inch screen, and cover the surface with a layer of very fine soil sifted through a one-sixteenth inch screen. Tamp the soil lightly, and sow the seeds evenly and thinly, but do not cover them. Immerse the pans in water to within an inch of the rim. It will rise by capillary action until the soil is well soaked. Do not water *Calceolaria* seeds with the watering can or other overhead method.

Place the seed pans in the coolest greenhouse, and shade from bright sunlight. After germination, carefully prick off the seedlings one-half inch apart in flats or large pans. When crowding occurs, transfer the plants to one and a half inch pots. Later when good growth has been made, repot into four inch pots, and finally during November repot into seven or eight inch ones. In the case of the September sown batch the final potting will not be done until January or early February.

Soil and Potting: A light, porous soil is essential for the *Calceolaria* in all stages of its growth, preferably one containing humus in the form of leaf soil or dried well rotted stable manure. Prepare the soil in the following proportions—Fibrous loam, one-third, sand, leaf soil, and stable manure, mixed two-thirds. Pass the whole through a one-half inch screen for the final potting, and mix it thoroughly. A soil in which heavy loam predominates is not conducive to the formation of the root system of the *Calceolaria*.

When re-potting do not press the soil too firmly around the ball of earth, but simply until a fair amount of resistance is felt by the hand. Pot only slightly deeper than the previous potting, so that moisture will not constantly be in contact with the leaves, a very detrimental condition. Clean well drained pots are essential, otherwise when repotting it will be difficult to remove the plants without injury to the roots, which will adhere to the dirty sides of the pots. Do not allow a root bound condition, always repot when a fair proportion of the roots have reached the circumference of the ball.

Light and Temperature: Except during the Winter months, do not allow direct sunlight to come in contact with the plants. This is harmful, especially when in the seedling stage, therefore afford shade, and during Summer maintain as cool a temperature as possible. In Winter an average temperature of 48 to 50 degrees F. will suffice. With the increasing warmth of Spring ventilate freely, check the fires, and avoid a rise in temperature above 70 degrees if this is possible.

Watering and Manuring: Use water which is the temperature of the greenhouse in which the plants grow. Cold water from the hose is harmful. Water only when the soil is fairly dry and the plant approaches the wilting point, but does not actually wilt. Tap the pot with the knuckle and if a bell-like ring is heard, apply water. During fine weather dampen the floors and other surfaces to afford atmospheric humidity, but discontinue on wet and unfavorable days when the atmosphere is moisture laden.

Manures may to the best advantage be used when applied in a liquid state. Afford them only when the plants are well established in their pots, discontinue the practice before the flowers are well advanced. A one inch potful of guano to two and a half gallons of water, urine from the cow stables, diluted with ten parts of water, Black Soot water diluted, Nitrate of Soda, one-half ounce to three gallons of water, are all good manures. Clay's Fertilizer, however, which is not hardly obtainable, is perhaps the best. A single handful to three gallons of water is sufficient. *Calceolarias* may safely be watered with one or other of the forementioned manures once weekly.

Insects Pests: The pests of the *Calceolaria* are not numerous, and are easily eradicated. The Green Aphide and the White Fly are the most troublesome. Fumigate with any good tobacco paper, or spray the plants with a very weak solution of nicotine. The White Fly may only be satisfactorily removed by fumigating with Cyanide of Sodium, or of Potassium. Use one ounce of the Cyanide, two ounces of Sulphuric acid, four ounces of water. Pour the acid into the water, place the containers in the greenhouse away from the foliage, close the ventilators, drop the Cyanide into the mixture of acid and water. Leave hurriedly and lock all doors, so that no one may enter. Hydrocyanic fumes are deadly poison. The most favorable temperature at which to fumigate is 60 degrees F. The time just at dusk. All plants, floors and other surfaces should be perfectly, or as nearly dry as possible. One-half ounce of the Cyanide is sufficient for every one thousand feet of air space in the greenhouse. The application of one ounce as for ordinary plants may seriously injure the *Calceolarias*.

The Rockgarden at Lindenhurst

RICHARD ROTHE



Rockgarden construction at "Lindenhurst." Pocket building on a steep grade.

LINDENHURST, the country place of Mr. and Mrs. John Wanamaker at Jenkintown, near Philadelphia, confers the distinction of an ideal American home. Going by outside appearance there is no sign of any conspicuous display of decorative splendor noticeable. And yet, beholding the wide wrought iron gateway with its discreet arrangement of evergreen plantations on Old York Road; glancing over the open rolling lawn expanses from the County Line Road and passing by on Washington Lane and seeing the towering masses of old venerable tree-growth covering the north and northwesterly slopes of the distant ground elevation where the residential mansion is situated on Lindenhurst unmistakably conveys the impression of eminent refinement and dignity to any observant outsider. This impression gains in strength when being privileged to see and study the grounds. To begin with, the beauty of the architecture of the large residential building, surrounded on three sides by an approaching natural tree vegetation of both

formal garden, placed his tennis court on the front lawn of Lindenhurst as a demonstration evincing the possi-



Rockgarden at "Lindenhurst" with miniature ravine. Midsummer effect.



Rockgarden construction of "Lindenhurst." Sample of concentration on the summit.

age and picturesqueness profoundly emphasizes the distinguished private home character. Coming in quest of object lessons in garden conceptions of merit the visitor is not going to leave disappointed. He will, however, see none thereof subjoining the residence. At Lindenhurst they are widely distributed over a ground area of about 100 acres, representing artistic insertions of various designs into a, by nature, very beautiful landscape. The extensive formal garden with pergola and large basin for aquatics situated near the big range of greenhouses is an example of enchanting simplicity. We are prone to look at a tennis court as an object more or less interfering with the beauty of a landscape and are often trying to sidetrack it. Mr. Geo. Penticost, landscape architect, who was also the designer of the

bilities for transmuting an unattractive structure into a decorative object. As extensions running in the direction of the length axis of the court there are two small formal gardens, chiefly for annuals, augmenting the ornamentality in total effect.

A retrospective survey over the 45 years of Lindenhurst's evolution shows a deep innate love for natural beauty on the part of Mr. and Mrs. Wanamaker. As their personal interest in the grounds never vanished there was no stop in evolutionary activities. Consequently the professional gardener entrusted with the superintendence must be a personality not only of a broad knowledge, but also of ideas and initiative, with the necessary aptitude for complying with the wishes and personal beauty conceptions of the owners. Those have proved

to be the pre-eminent attributes of Mr. John H. Dodds who, since 1906, has been devoting his energies in sincere and constant efforts to maintain the distinguished standard of the grounds in his charge. And as it happened, his services cover the most progressive period in the long evolution of Lindenhurst. Of the various alterations and ground improvements ensuing out of the erection of the new residential mansion there were many of importance taxing the skill of the landscape engineer and the talents of the decorator alike.

During Fall, 1915, when it became known that a rockgarden was going to be introduced as a new feature on the grounds of Lindenhurst it was the foregone conclusion of the alert Philadelphia craftsmanship to expect work accordant with the traditional standard of the place and the discriminating perceptions of natural beauty by its illustrious owners. The locality decided on was a grassy slope running down to



Rockgarden at "Lindenhurst" six weeks after planting.



Rockgarden at "Lindenhurst" with pool. Midsummer effect.

the edge of a path which led to the nearby spring and bath houses. A huge deposit of rocks being available at a comparatively short distance it was evident that even at the extensive and elaborate building contemplated, the total expense could be kept down on the conservative base customary at Lindenhurst. For assisting in solving the more or less intricate problems of the construction Mr. Dodds secured the services of the writer of this article. The crew of laborers employed at the actual work of building varied from 4 to 6 men and the time required for both sections approximated the total of about three months.

In rockgarden building on a large scale we must aim to adjust ourselves to the natural conditions of the ground. At Lindenhurst it was necessary to go a step further, that is, endeavor in creating the illusion of our work being by nature an integral component of the landscape. In such cases it remains for the builder to be cognizant of the importance of any existing rock formation confronted with.

The illustrations depicting "Pocket

Building on a Steep Grade" and "Sample of Concentration on the Summit" represent solutions of problems which in the pursuit of rockgarden building we frequently are facing. In the design of the lower section near the spring house the attempt to reproduce the picturesque ruggedness of some rock-strewn mountain recess is plainly apparent. As features calculated to add in total effectiveness the building of a miniature ravine and a pool at its lower end may be mentioned.

Observant visitors of Lindenhurst are often favorably impressed by the beauty of evergreen effects both as undergrowth in thinly wooded sections and as decorative embellishments along the outskirts. In naturalizing rhododendrons, azaleas, mountain laurels and dwarf conifers of the spreading kinds of Mr. Dodds excels many of our landscape gardeners of otherwise perhaps enviable reputations. Mastership in naturalizing is an indispensable attribute for superior work in rockgarden planting on a large scale. At Lindenhurst the great divergence in exposures demanded an intimate acquaintance with the plant material as adapted for dry, sunny situations, and again for semi-shaded and moist positions. More—
(Continued on page 184)



Rockgarden at "Lindenhurst." May effect a year after construction.

Ornamental Flowering Trees

ARBORUM AMATOR

(Continued)

THE SMALLER FLOWERING TREES

Catalpa Kaempferi: This species of *Catalpa* is from Japan. It is quite distinct from the larger *Catalpas*, *speciosa* and *bignonioides*. *Kaempferi* makes an upright growth, and attains a height of only 30 feet. This species begins to flower when quite young producing in July panicles of campanulate, yellowish white blooms, which are followed by long slender seed pods. The foliage of this *Catalpa* differs from that of the large growing species in that it has a light purplish hue when young, and carries this tint throughout the season. Its upright growth makes it suitable for planting where a tree of spreading habit could not be well used.

Tea's Hybrid Catalpa: This is the smallest of all the *Catalpas*. Its leaves have the purplish tint of *Kaempferi*, but its flowers are larger and more abundant. They are also spotted with yellow and violet and are fragrant. This hybrid of *bignonioides* and *Kaempferi* is an admirable little tree for any situation where only a small tree can be used.

Flowering Cherries: The flowering cherries when in bloom make a beautiful display. There are several species and varieties, namely, the Japanese double pink, the old Chinese double white, the weeping form *rosa pendula*, and *Japonica Veitchii*. The Japanese is known as *Sieboldi rubra plena*, the Chinese as *Sinensis*, and the other two as named previously. *Rosa pendula* is, when in foliage only, a beautiful weeping tree, and when in flower, surpassingly pretty. Its pink buds appear in very early Spring and when open make the tree look like a cloud of snow. The double flowers of *Sinensis* also are pink when in bud, but white when fully expanded. *Sieboldi* also bears double flowers which are red not only when in bud, but after they are expanded and until they are about to fall. *Sieboldi* is, we think, the finest of all the double flowering Cherries. *Veitchii* strongly resembles *Sieboldi*. We should also mention the species, *axiom*, which is simply a double form of the garden Cherry of the Ox-heart section. Its double flowers come in pairs, while those of *Sieboldi*, *Sinensis* and *Veitchii* come in tufts of a dozen or more on each cluster. The foliage of *Sieboldi* in Autumn changes to a beautiful yellowish bronze color. The flowering Cherries belong to the genus *Prunus pseudo-cerasus*.

Flowering Crab Apples: The flowering crab apples may be divided into those with double and those with single blooms, both being desirable. Of the double varieties, *Pyrus malus ioensis flore pleno*, Bechtel's Crab is, perhaps, the most beautiful. Its very double fragrant flowers are of a soft "Daybreak pink" color, and larger than those of other varieties, resembling small roses. The tree is of pyramidal shape. In planting it should not be crowded in among other trees. *Pyrus malus Scheideckeri* is another very desirable double variety, whose blooms are of a bright rose color. There is also a pretty double white variety, namely, *Spectabilis albo flore pleno*. Of the single varieties the best are the very sweet scented *Pyrus malus coronaria* and *Pyrus malus floreunda*, both bearing light pink flowers, and *Parkmani*, whose flowers are pink in bud but white when expanded, and whose beauty is enhanced by its dark green foliage.

The flowering Crabs, though reaching sometimes a height of 20 feet, all begin to flower when only very small trees.

Double Flowering Peaches: Of the ornamental flowering fruit trees, which are grown for their pretty flowers, and not for fruit, we have already spoken of the Crab apples, and cherries. There are three varieties of double flowering peaches, namely, those bearing double white, double pink, and double red flowers. Each one of these is desirable but when the three varieties are planted in combination they form an admirable group. These trees should be planted, the same as the varieties of peaches grown for fruit, in the Spring, not in the Autumn. This plan of grouping these flowering peaches may be enlarged and a group made to include with these the flowering Crabs and Cherries. Such groups exist in this country and in the flowering season are indeed a beautiful sight.

Magnolias: The flowers of most of the *Magnolias* are among the largest, showiest and most beautiful of the blooms of any of the ornamental flowering trees, and those of some species have an exquisitely sweet fragrance. Longfellow speaking of this fragrance says: "Faint was the air with the odorous breath of *Magnolia* blossoms." The foliage also in many species is very large and handsome, and in some species evergreen in the warmer parts of our country. This makes *Magnolias* even when not in bloom notable at once among other trees. The fruit too of many *Magnolias* is large, bright colored and showy. The several species vary in height from only a few feet to one hundred or more. It is safe to transplant many trees in either Spring or Autumn, but *Magnolias* should be transplanted only in the Spring. We will speak in this article only of the smaller *Magnolias*.

MAGNOLIA GLAUCA: *Magnolia glauca* (Sweet or Swamp or White Bay, as it is variously called) is a small, attractive tree. It is indigenous from Massachusetts to Florida near the coast extending in the southwest to Texas. In the south it is evergreen. Its very fragrant white flowers are globose in form and appear in May or June, and are followed by pink fruit. This pronounced fragrance of its flowers has given it another common name, namely, "The Sweet *Magnolia*." This species has a beautiful foliage, bright green above and glaucous green on the underside. The round, pink, or light red fruit pods form a pleasing contrast to the green foliage. When these pods open, and the seeds, each suspended by a light thread, droop from them, the tree is indeed an interesting sight. *Glauc*a sometimes produces a few flowers out of season. This species flowers when small; but in time it attains a height of 20 to 25 feet.

MAGNOLIA SOULANGEANA: *Magnolia Soulangeana* (Soulange's *Magnolia*) is perhaps the most popular of all the small kinds. Its flowers, campanulate in form, are purplish outside, but white within, and often fragrant, and appear in May after *Stellata* has finished blooming and before *Glauc*a blooms. By planting four species of the smaller *Magnolias*, namely, *Stellata*, *Soulangeana*, *Glauc*a and *Thompsoniana*, we may have a succession of blooms of these small *Magnolias* from late March well into July. Sometimes when an old *Soulangeana* is cut back severely in Spring or when it suffers from a drought in its usual blooming

season, it blooms out of season in Summer. This species and its several varieties, namely, *Lancei*, *Nigra*, *Alexandrina*, *Nobertiana*, and *Speciosa*, which differ little from the species in color of flower or time of blooming, are among the hardier of the Magnolias. The flowers of *Lancei* are crimson outside instead of purple and it blooms a little later than the species, *Soulangiana*. *Soulangiana* is a hybrid produced from *Obovata* and *Yulan*.

MAGNOLIA THOMPSONIANA: Thompson's *Magnolia*, a hybrid of *Magnolia glauca* and *tripetala*, is of garden origin and not as hardy as either of its parents. It forms a small tree but also grows in shrub form. The fragrant flowers of this hybrid appear in June and July making it one of the latest blossoming Magnolias. Its foliage, though coriaceous, is deciduous in the North.

MAGNOLIA STELLATA: *Magnolia stellata* or *Halleana* (Hall's Magnolia), a native of Japan, has a spreading and shrub-like growth. This species flowers freely and comes into bloom, when quite small. Its sweet scented blooms appear before its foliage in late March and April and resemble those of the Water Lily, because of their narrow petals. When in the bud, its semi-double flowers are pink. This Magnolia is quite hardy and is one of the earliest flowering trees, or we

suppose we should say Shrubs, as it almost always is grown in shrub form. If it is given ample room, it will without pruning grow into a well shaped shrub. Specimens 40 years old are no more than 12 feet high. *Stellata* is very suitable for a small lawn or garden. It has a twiggy growth and each twig bears a flower. This species belongs to the Chinese section of Magnolias.

MAGNOLIA PARVIFLORA AND WATSONI: Among other Magnolias, whose blooms appear before their foliage is *Parviflora*, a small tree, a native of Japan, whose fragrant, white cup-shaped flowers are borne on long pedicels, and have pink sepals and crimson stamens. This species blooms in June. Closely related to *Parviflora* is *Watsoni*, also a native of Japan, the beauty of whose white sweet scented June Blooms is increased by the crimson center formed by its bright colored stamens.

We have spoken thus far only of those smaller flowering trees which attain a height of no more than 30 feet. We may say that many Magnolias which do not come within this class because they ultimately reach a greater height, nevertheless begin to bloom when quite small. Of these Magnolias we will speak in our next article which will be on "Ornamental Flowering Trees of Medium Size."

Growing of Mushrooms

S. W. Carlquist

IT is not as difficult to grow mushrooms successfully as many people seem to think. A cellar or tight shed under the barn is a good place to grow mushrooms during the Summer months; whereas for Winter and cold weather it will be necessary to have a place either provided with some means of heating or so constructed that the place will be frostproof. For summer use the beds should be made up from March to May and for winter crops from September to December. Good material for beds is best obtained from livery stables. In gathering up the manure take all the saturated straw with the droppings, pile this into a rather deep compost and have on hand some good moist friable soil about one-third in bulk to the manure. As soon as the manure pile shows signs of fermentation turn the mass over thoroughly, mix, and see that the manure on the outside gets in the center and *vice versa*. After the compost has been turned, cover over with a layer of soil, incorporating this with the manure, and repeat the operation morning and evening until in about a week's time the rank heat has subsided and the whole mass presents a dark brown spongy color. With the addition of soil each time of turning, as mentioned above, there is little danger of the compost overheating and burning. Should the mass show signs of dryness, however, use the watering can until sufficient moisture is obtained.

In laying the beds have two men do the operation, one to shake up and throw in the manure, and the other to pack in the material firmly and even. Lay the beds firmly, about 14 to 16 inches thick and then pound or tramp down to about 10 to 12 inches. Place a thermometer in the bed and when after a few days the temperature has subsided to 85° or 80° spawn the bed. Fresh American pure culture spawn is always reliable and will produce a good crop of solid fine flavored mushrooms. Break up the bricks of spawn into pieces about

3 to 4 inches square, place over the bed 12 to 14 inches apart. Take a trowel and plant in the bed so that each piece will be covered with about 1 inch of manure. Firm the bed down, smooth and level. In about ten days or two weeks cover the bed over with some good garden soil passed through a rather coarse sieve, spread out level and firm down to an inch thickness. The ideal temperature in a mushroom house is 55°. In the summer months it is sometimes hard to keep the temperature down below 60 to 65°, but by keeping the floor well sprinkled and the place tight and dark in the day time and by opening the door or ventilator wide by night or even having a large cake of ice on the floor, the temperature may be kept below 70° most of the time. If the room stays around 70° for any length of time the whole crop is liable to be ruined as maggots will be sure to develop. As soon as the beds show signs of dryness, they should be given a sprinkling of tepid water in which a handful of nitrate of soda has been dissolved to each two gallons of water. Pick the mushrooms by twisting them up from the bed. After each picking go over the beds, pick up all rotted dead heads or withered small specimens and fill in all the holes with soil. After the beds have been in bearing for some time and the crop shows signs of weakening, sieve a layer of good moist soil over the whole bed. Water this, using tepid water and nitrate of soda as mentioned above and the beds will soon show new life. This operation may be repeated from time to time. If proper temperature and a good growing atmosphere is maintained a bed of good material should continue to bear for about three months' time. Be sure to procure the spawn from a reliable firm and keep the same in a dry airy place some time before it is needed. The writer has been growing mushrooms for sixteen years and rarely has been unable to pick good specimens any month during the year.

Swarming Time

H. W. SANDERS

THE swarm is a phenomenon peculiar to bees. There are other insects that are sociable but these have certain periods in their life history in which the life of the colony is suspended and it is generally during these alternative periods that the natural increase takes place. With the honey-bee, however, the entire cycle of operation is passed in the community form, and therefore bees have to make their increase by a colony splitting into a number of separate swarms. Under natural conditions swarming is the only manner in which bees can perpetuate their species, for a certain number of colonies die each Winter, or from disease and but for the number of new swarms emerging they would have long ago become extinct.

Swarming is marked by the most remarkable exhibitions of instinct in the life of a colony. We know that by the time the season is far enough advanced for swarming to take place, that all the bees from the season before have come to the end of their lives, and although the queen-bee may be the same one who went into Winter quarters the course of events is the same even if a young queen of the season's rearing be the hive mother. Here it may be said that with a young queen swarm control is easier in actual practice, the point that we wish to make being that the process of swarming is in no way dependant upon the previous history of the colony. It may never have swarmed before, or it may have swarmed several times the previous season, but still, the preparations are made in exactly the same way, and the swarm issues and behaves as all swarms do and can be controlled in the same manner.

A strong colony of bees build up very rapidly in the Spring. From the time when they come out of their Winter quarters, until the first flowers begin to yield honey, the bees raise thousands of young ones, the process of which consumes the remainder of the stores of honey laid by during the previous season. When the honey begins to come in in any quantity, which in the Northern States occurs at the end of May or the beginning of June, the bees are beginning to feel rather crowded, and it is this crowded condition that constitutes the most obvious stimulus to swarming. The amount of ventilation possible, depending upon the size of the entrance, is also a factor in the case, but the subject is not thoroughly understood and bees will swarm, or will refrain from swarming at times in quite an incomprehensible manner.

The actual process is interesting. The bees begin by starting queen-cells at various places in the hive. These cells are the same as those made to supersede a laying queen, but are more numerous, and are built over worker larvae or eggs. About eight or ten days after the cells have been started a swarm may be expected, and for a few days previous to its emergence the normal activities of the hive are to a large extent suspended. The bees "loaf," as beekeepers says, and if the weather is at all warm they hang outside in great bunches. The queen quits laying eggs, so that she may be the better able to endure the long flight to her new home, and the bees send out scouts to search out a new place for the swarm to begin their housekeeping. It may be a hollow tree, a cleft in rocks, the chimney of a vacant house, or some such place, but there is no doubt that the scouts identify it

for the swarm always flies straight to its new home. A neighbor of our last season found a number of bees exploring a drain that was placed to carry the water from a sleeping porch, and sure enough two days later a large swarm arrived and took possession. A nearby beekeeper smoked them out and hived them before they had made themselves too much at home.

Finally upon a warm day, usually in the morning, a mass of bees rushes violently out of the hive, and after circling wildly in the air for a time they cluster on the branch of a tree, or a post or any convenient place. The queen is usually amongst the last to leave and her presence is necessary before the swarm will continue on its way. If by any chance she gets lost the bees will return to the hive from which they came. This fact is made use of in some of the plans for dealing with swarming and by clipping the queen's wings the loss of a swarm is avoided. It is a notable and beautiful sight to see a swarm emerge, and for a few moments the air seems to be full of bees with flashing wings, whilst the sound can be heard at a considerable distance. Our own bees are located quite a little distance from the house, yet we have been on some occasions apprised of the swarm by hearing the loud humming from indoors.

The swarm may hang clustered for a few minutes only, or for several hours—indeed cases are on record where the bees actually built their combs in the open and remained. One is tempted to wonder whether these swarms issued without the scouts having found a suitable place or if not, just what the stimulus is that makes the bees break cluster and decamp. However, the fact is that they will, sooner or later, take wing and fly across the country to their chosen destination.

It is during this clustering period that the bees may be hived. We shall be giving more explicit directions in subsequent months, but in brief, the hiving process consists of shaking the bees in front of a suitable hive. As soon as ever some of them begin to go in the rest will follow and usually they will remain without trouble.

A swarm of bees is usually very good-tempered, due to the individual bees having filled themselves with honey in preparation for the migration—a condition in which bees seldom use their stings. We have handled swarms by taking the masses of bees in the bare hands and placing them in a hive. Shaking them in front will however usually accomplish the desired end and the bees will soon be hard at work gathering honey.

Bird Houses for the Garden

There is a very close connection between birds and seeds, or at least between birds and the successful growing of plants. They are one of man's best allies in the war against insect life of every description, and their presence should be assiduously cultivated. A bird house not only attracts them but it is in itself a very picturesque adjunct to a garden.

You have communed with great men to little purpose if you have not learned that, however else they may have differed, in one respect they are all alike. Their sinews grew by labor.—*John McClintock.*

Bees Adrift Amongst the Apple Blossoms

WE have heard of a man who was so desperate over the sight of bees swinging in and out of his fruit trees and rifling the flowers just as they pleased, that in spite of advice to the contrary from experienced friends and counsellors, he put dishes of poison in his garden in the hope of putting a check on the exuberance of the unbidden guests. Needless to say, his tactics were all in vain, and the winged visitors still continued their merry round. But were they doing a great deal of harm and proving themselves worthy of such treatment? The answer is "No," and the owner of the orchard was really trying to drive away his friends if he had only known it. The bees were responding to a natural instinct which made them come in answer to the challenge of color, scent, and promise of honey-store held out to them by the

which they are put together, we shall inevitably be drawn to the conclusion that all have been formed with an eye to giving the flower the best possible chance to reproduce itself; and that this, apart from any aesthetic considerations, is the main object for which the flower was called into being.

Taking the apple blossom as an illustration, on the outside we find some stout, green leaves which form a sort of cup to hold together the more precious interior parts as well as protect them while in the young stage. Inside this is the pretty pink and white part which attracts our notice as well as that of the bees, and is made up of looser and more open leaves. The most casual observer will see that, while a little protection is afforded by these, their chief use is to provide a means of attraction and display. This gaily



Apple tree in bloom on Estate of Mrs. Horatio Halloway, New Bedford, Mass. What a picture! I was called to treat this tree which was decayed in several limbs and trunk, the tree being very old and of value in several ways. First for its having been planted by a dear friend. Second, on account of its beauty in Spring time. Third, screening as it does, a very unsightly old barn in the corner of the estate. Fourth, for its shades in the Summer-time, as shown by the tables and chairs standing under. What money could replace such a tree? Is it not a beautiful setting to the landscape?—Arthur M. Horn.

flowers, and at the same time performing for the orchard owner an important piece of work.

Certain plants known as entomophilous (insect-loving) need insect visitors to enable them to reproduce themselves by bearing seed; and long experience and inherited instinct have taught the insect where to go as well as to associate certain well-marked flower characteristics with the presence of food in the shape of honey and pollen. In return for this, the insect comes to the help of such flowers as need its assistance, in a very definite way. If we examine the different parts of any flower and note the manner in

colored ring of leaves is known as the corolla, and is usually large, conspicuous, and highly colored in those flowers which desire the presence of insect visitors. In addition, its form is often highly modified so as to enable the flower to make the best use of the insect. The *gladiolus* and similar flowers have the lower portion expanded with a lip which makes a convenient landing stage; while others, *e. g.*, members of the *salvia* and pea families, have the corolla so shaped that the insect must alight on the flower or enter it in a special way.

At the base of the corolla leaves is a well-marked.

greenish-yellow gland containing nectar which is of no direct use to the flower itself, and is a part of the lure to entice the desired visitor. Standing directly above this is an indefinite number of bodies called stamens, each consisting of a threadlike stalk terminable by an anther or case containing a powdery substance known as pollen. The anthers, when ripe, open to allow the pollen to escape.

Inside the stamens is the pistil, consisting of (a) a basal portion usually rounded, known as the ovary, enclosing the ovules, which if fertilized will become seeds, while the ovary itself will become the fruit; (b) an erect, tubular portion, known as the style; and (c) a sticky apex more or less differentiated from the style, called the stigma. For reproduction to take place, the pollen from the stamens must reach the stigma, and some flowers are so constructed that it is impossible for this to take place without the aid of outside agencies, such as wind or insects. Such may be flowers in which the pistil comes to maturity before the anthers, and is ready to receive the pollen before the anthers of the same flower have opened to shed it, and vice versa; e. g., some mallows, geraniums, campanulas, plantains, and magnolias. In these, if seed is eventually to be formed, pollen must be brought to the stigma either from an older or a younger flower as the case may be. Or, again, we have monœcious plants which have the pistil in one flower and the stamens in another, like the mealie and *arum*; or dioecious, where the staminate and pistillate flowers are borne on different individuals, as in the case of the paw-paw, castor oil, pepper tree, etc. In these cases, if no outside agency comes to the rescue, of course pollination is not effected, the flowers simply withering and falling to the ground after a short time without producing fruit. In this connection the flowers of the wild fig (*Bosvijge*) and of the bread fruit are interesting as showing how absolutely dependent a plant may be on insect visitation for the production of fruit. The flowers of the fig are either staminate or pistillate and borne inside a case, through an opening in the top of which the insect has to enter. If a tree be unvisited, the ground beneath at flowering time will be found strewn with blossoms, which apparently began well and then made a sudden stop; while those of a tree which is in the running with insects will have sturdy well developed flowers still on their stems and on the way to ripen into fruits. Some trees, like the maple, are polygamous, bearing all three kinds of flowers—those with pistil and stamens, and those with stamens or pistil only. Some of the *Chenopodiums* bear on the same plant perfect and pistillate flowers.

The transference of pollen from one flower to the ripe stigma of another either on the same or on a different plant is known as cross-pollination, and it is obvious that in most of the instances mentioned above the flowers themselves seek it, and it is Nature's way. But even where the flowers are possessed of both stamens and pistil, it has in many cases been proved that a greater number of healthy seedlings are produced from the plant when the seeds are the result of the union of foreign pollen with the stigma. The flowers of some varieties of apple can use their own pollen or that brought by insects, in which case the seedlings produced are healthier and more vigorous; recent investigations have shown that some species are self-sterile and so altogether dependent on foreign pollen. As the bee pushes about in the flower either to gather the pollen for bee-bread or to find the honey, he gets his body well dusted with the grains which

are often provided with ridges and otherwise roughened surfaces to make them adhere. Flying to another apple blossom, where his body comes in contact with the stigma, the pollen gets transferred and cross-pollination is effected.

In primroses, pentanisia, and other flowers we find styles and stamens of varying lengths. Flower A will have long styles and short stamens, while B will present long stamens and short styles. In the case of A it will be seen that self-pollination is out of the question, and at the same time it has been determined that the greatest number of fertile seeds are arrived at when pollen from the long stamens is made (by insect agency or otherwise) to pass not on to the short-styled stigma of the same flower but on to the long styled stigma of a different flower. There is the same difficulty in securing union between a short stamened and a long styled primrose as there is in effecting a union between two distinct species. The union may take place, but it will either prove barren or the quantity of seeds and the vigor of the resulting seedlings be diminished.

Primitive flowers were evidently cross-pollinated by means of wind, like the fir. Insects have apparently played a large part in their evolution, helping to determine the lines on which such evolution took place. They probably first visited flowers for the sake of pollen, which, in wind pollinated flowers, is produced in great abundance. The amount of pollen then became more restricted, the plant expending its energy on the provision of special organs for the secretion of attractive juices; after which came concealment of honey, so that there would be no chance of the visitor escaping with his booty without fulfilling the purpose for which the flower attracted him, and lastly the appearance of gaily colored and protective corollas.—*South African Gardening and Country Life*.

THE ROCKGARDEN AT LINDENHURST

(Continued from page 179)

over, the arrangement offered constant opportunities for manifestation of visual sensitiveness in regard to color blendings. Taking all these in account, it seemed that the ambition of Mr. Dodds in attaining a full effect the first season, was well nigh verging on the impossible. Nevertheless he succeeded. The rich floral color display of the new rockgarden at Lindenhurst during May, 1916, six weeks after planting, was the achievement of an enthusiast; the professional exploit of a gardener with an inborn love for the work he does. Granted, the construction, just as well as the arrangement of the planting, are open for criticism. But after careful weighing of local advantages and disadvantages, we have been working under, is there not always room for improvement on things conceived and executed by human beings?

Since its introduction in 1916, the vernal glory of the rockgarden at Lindenhurst has been exerting its charm every ensuing season. Not the exotic beauty of most of the inmates seen in our regular flower gardens, but pre-eminently the beauty of the blossoms of our native shrub and herb vegetation as they are ushering in the Springtime on distant hillsides and giving cheer to the desolate aspect amid our weird mountain regions of high altitudes. It is this extremely hardy creeping and crawling herb vegetation which so readily and quickly forms a mit with the rock work. The typical rockgarden denizen is the medium for establishing a dense ground covering apt to keep the weeds down. According to observations of the superintendent of Lindenhurst, the care of rockgardens requires only one-third of the time necessary for the same area within ordinary flower gardens.

Plant Names in the Catalogs*

FRANK B. MEYER

ACCURACY and consistency are not indispensable to success in the handling of plants; but they are an evidence of culture and of careful and orderly habits. For this reason they are very desirable.

There is fortunately already in existence an excellent work that ought generally to be recognized as the standard. Reference is made to Bailey's *Cyclopedia of Horticulture*. Apparent contradictions made to it here are proffered modestly. There would be no desire, even if it were at all possible, to forestall any action of the American Joint Committee on Horticultural Nomenclature already at work. The object is rather to make a few summary statements that may serve for the present and to correct some prevalent errors.

The ideal catalog would list, under different heads like Evergreen Trees, Evergreen Shrubs, Deciduous Shrubs, etc., in alphabetical order, the botanical names followed in each instance by the common or popular name or names.

In botany and in other sciences names of Greek and Latin origin, and preserving the forms of these languages, are employed for two reasons. In the first place, they afford greater accuracy and uniformity than do the common names. One and the same plant, for example, may have various names in different parts of the same country, or the name applied to a certain plant or to a certain variety of a plant may sometimes be found in use for a different plant or for a different variety in some other region. The second reason is that these two languages, after having served long as the sole languages of learning, now furnish a vocabulary that is understood and accepted all over the world.

The greatest difficulties in the handling of these names come from the inflectional forms. The ancients, in their childlike way of looking at things, personified them. In general, all objects that were beautiful or graceful or in any way suggestive of femininity, like most trees and flowers and one's nurturing country, were regarded as feminine. Strength, such as is possessed by a mountain or by a stream in a mountainous country, suggested masculinity. The conception of some things as neuter, that is, as neither male nor female, arose late. In certain instances, however, it is impossible to penetrate into the ancient mind and to discover just why a certain gender was assigned to a particular object.

In becoming annexed to a noun the adjective must show by its ending the gender of the noun. The following table displays the possible endings for adjectives, the endings being printed in heavy type. These are the endings of the adjectives in Latin, to which those of the Greek are reduced.

	Masculine	Feminine	Neuter
Sg.	scabiosus	scabiosa	scabiosum
	ruber	rubra	rubrum
	bicolor*	bicolor	bicolor
	canadensis	canadensis	canadense
	elegans	elegans	elegans
	longipes	longipes	longipes
	major	major	majus
Pl.	scabiosi	scabiosæ	scabiosa
	rubri	rubræ	rubra
	bicolores	bicolores	bicolora
	canadenses	canadenses	canadensia
	elegantēs	elegantēs	elegantia

Masculine

longipedes
majores

Feminine

longipedes
majores

Neuter

longipedia
majora

*For this, and for concolor and discolor, the alternative forms in -colorus, -colora and -colorum are rare in Latin literature, and late, and should therefore not be used to-day.

These endings must not be used indiscriminately; the adjective must always conform in gender, and in number, to the noun. *Acer rubrum* and *Acer pyramidale*, for example, are correct forms, for *Acer* is neuter.

This noun *Acer*, probably because it was introduced late, has come down as a neuter, in spite of an eminent grammarian's attempt made long ago to establish it as a feminine in accordance with the general rule for gender stated above. This rule usually prevails over the grammar's practice of regarding all names ending in **a** as feminine,—like *Paeonia*; all in **us** as masculine,—like *Philadelphus*; all in **um** as neuter,—like *Laburnum*.

The most important plant names that are now recognized as neuter are, in addition to all ending in **um**, or in **on** (except *Erigeron*) which is the Greek equivalent for the Latin **um**, *Acer*, *Sassafras*, *Acanthopanax*, *Benzoin*, *Ribes*, *Muscari* (originally *Muscarium*), *Aethionema*, *Arisema*, *Papaver*, and *Cyclamen*. These each take an adjective ending in **um**, not **us** or **er** or **a**; in **e**, not **is**; in **us** (as of *majus*), not **or**; or may take an adjective like *bicolor* or like *longipes*.

Those that are treated as masculine are *Calycanthus*, *Ceanothus*, *Cephalanthus*, *Cytisus* (common gender, i. e., sometimes regarded as masculine and sometimes as feminine), *Opulaster*, *Philadelphus*, *Rhus* (common gender), *Rubus*, *Symphoricarpus*, *Siphon*, all names of perennials ending with **anthus**, *Echinocereus*, *Echinops* (common gender), *Eremurus*, *Erigeron*, *Helleborus*, *Pentstemon*, *Ranunculus*, *Thymus*, *Trollius*, *Narcissus*, *Crocus*, *Gladiolus*, *Hermodactylus* and *Hyacinthus*. For each of these the adjective must end in **us**, not **a** or **um**; **or**, not **us** as in *majus*; **ns** or **es**.

The names of the other more familiar plants are feminine and for them adjectives must end in **a**, not **us** or **um**; **is**, not **e**; **or**, not **us** as in *majus*; **ns** or **es**.

When, in a compound name, the second word is in apparent contradiction to the above rules it may be a noun, as in *Viburnum Opulus*. In that case it should be printed in the list with an initial capital letter. Adjectives that stand after these should agree in gender with the main part of the name. Additional words of this kind are *Tanyosho*, *Mughus*, *Laricio*, *Strobus*, *Cotinus*, *Caractacus*, *Hinayo*, *Agnus-castus*, *Cneorum*, *Uva-ursi*, *Mezereum*, *Ibota*, *Coco*, *Lantana*, *Lentago*.

After the type name there is often found for a variety the name of the man who introduced it or in whose honor it has been named as in *Spiraea Billiardii* and *S. Bumalda* *Anthony Watereri*, the **i** being the Latin equivalent for the English **of** or **'s**. The addition of **ii** instead of **i** is sometimes a matter of preference depending upon euphony. But there is good historical warrant for always using only one **i**. This would simplify the matter. Of some names of men are found adjectival forms as in *Chamaecyparis Lawsoniana* and *Juniperus Sabina*; but the prevailing custom is to spell an adjective derived from the name of a country or other place with a small initial letter, as in *virginiana* and *japonica*.

Points additional to those above to be noted are:

DECIDUOUS TREES:

Acer: *horticola* is a noun, meaning "inhabitant of a garden." As a common noun it is not capitalized like *Ginnala* and *Negundo*.

The word *platanoides* means "like a plane-tree," the second part being a noun of Greek origin equivalent to the English "form" or "appearance." But found in composition, as here, it has adjectival force; yet it does not vary for the different genders.

The phrase *albo-variegatum* is correct, for the *o* of the *albo* is equivalent to "with," so that the phrase means "varied with white." In *Tsuga albo-spicata* the adjectival idea is "provided with white ears." In keeping is found for "double" *flore-pleno*, abbreviated into *fl.-pl.* An *albo*, or the name of some other color, might be added by means of a hyphen, or, if the color is intended to go with the plant rather than with the flower, an adjective might be added with the gender of the plant's name.

Gleditschia: *tricanthos* is similar to *platanoides* in being of the same form of all genders.

Prunus: *avium* is a genitive plural,—"of birds."

Tilia: *platyphylla* is correct, not *platyphyllos*, which is often found.

DECIDUOUS SHRUBS:

Calycanthus: *floridus* is regularly found; but it would probably be better to regard all plant names ending in *anthus* as feminine, as the books do *Chionanthus virginica*. Historically, however, *anthus*, the Greek word for flower, is neuter.

Cornus: *mas* is an adjective of peculiar form. It itself means "masculine." The alternative declensional form must be of feminine termination,—*Cornus mascula*.

Euonymus, as the name of a shrub or of a vining plant, should always be treated as feminine,—*E. alata* and *E. radicans vegeta*.

Philadelphus, like *Crocus*, *Hyacinthus* and *Narcissus*, owes its prevailing masculinity to its having started as the name of a man. The writer would prefer to have these last three names become feminine at once and is inclined to urge this for *Philadelphus* also.

EVERGREEN TREES present nothing not covered in the foregoing, except that in this division is often found *Taxodium*, simply because it is a conifer and has leaves resembling those that mark most evergreen trees. Its removal allows all of the list to be feminine.

EVERGREEN SHRUBS:

Cotoneaster is just as regularly found feminine as *Aster* is masculine. Would it not be better to regard both the compound and the uncompounded forms as feminine?

Mahonia is usually found with *aquifolium*, which evidently ought to be *aquifolia*.

Osmanthus should certainly not be followed by *aquifolium*, but better by *aquifolius*, if not by *aquifolia* in accordance with the suggestion about *anthus*.

VINES:

Celastrus orbiculata is correct, like *Euonymus vegeta*.

HERBACEOUS PERENNIALS:

Acorus is feminine and should therefor be followed by *variegata* even though the masculine *Calamus* stand between these two words.

Echinocereus is masculine because the Latin *cereus* is masculine. But in Latin the word means "wax-light" or "wax-taper." As the name of a plant would it not better be feminine?

Helianthus also would better become feminine, for the reason already stated in connection with *anthus*. In the Latin dictionary, though it is of masculine gender, it is found in the spelling *Helianthes*.

Iris has as its Latin plural forms both *Ires* and *Irides*. But this word has become sufficiently anglicized so that there need be no hesitancy in using the plural *irises*, which is euphonious enough, in such a phrase as "peonies and irises."

Lathyrus is feminine in Latin and there is no apparent reason for treating it as masculine.

Pæonia: the preferred form anglicized is "peony," with the accent on the *e*. The plural is, of course, "peonies."

Thymus in ancient Latin is *Thymum*, a neuter. Why not use it as a feminine instead of a masculine, as the books do now?

BULBOUS PLANTS:

Crocus, like *Gladiolus*, *Hyacinthus*, *Narcissus* and *Ranunculus*, a masculine, makes its plural in Latin by putting *i* into the place of *us*. In giving the plural form *Croci* the English pronunciation, which it is desirable to use for all Latin names, the *i* would be sounded as it is in "ice" and the *c* as in "city." (The letter *c* would have this sound before *e* or *y* also, while *g* before any one of these three vowels would be pronounced as in "gist." The English plural *cro-cuses*, however, is now used almost exclusively.

Gladiolus, which for the purpose may be included here with the plants that form bulbs strictly defined, has almost supplanted *Sword Flower* as the popular name. The old pronunciation with the accent upon the *o*, too, has nearly disappeared, and the *i* is sounded strong as in "die." The addition of *es* to form the English plural would be awkward; accordingly it is best to use the Latin spelling and then to pronounce the two *i*'s alike.

Hyacinthus has been shortened for English speech into *hyacinth*, the plural of which naturally becomes *hyacinths*. This form, like *cro-cuses*, has nearly supplanted the Latin form ending in *i*.

Narcissus might similarly be abbreviated into *narciss*, with the accent upon the second syllable, which,—so the writer has been told,—is the name of the flower in its old-world home. There is no change made for the plural. In this respect the word is comparable to "deer" in having lost the plural ending it had in the language from which it came over into English. It is easy, however, to pronounce the long *i* of the Latin plural form. The form *narcisses*, used in at least one of the bulletins issued by the national Bureau of Plant Industry, has certainly not acquired much vogue. This word, along with *Crocus* and *Hyacinthus*, the writer would much like to have become feminine; *Gladiolus*, because of the character of the plant and its size, it seems a trifle easier to retain as a masculine.

Muscari, owing to the uncertainty that most people are in as to its origin, also is treated like "deer" in being given no plural. But for the Latin why should not the original plural *Muscaria* be used?

Scilla and **Sparaxis** are singulars. If printed in lists after such words as *Tulips*, *Hyacinths*, *Narcissi* and *Crocuses* they should themselves appear as *Scillæ*, or *Scillas*, and *Sparaxes*.

The Point of View of the Professional Gardener

WILLIAM N. CRAIG

MADAM President and Members of the Garden Club of America: I feel very much honored in being asked to speak before your club, which has done and is doing so much to advance horticulture in America. I would that one more eloquent than I, and one who could better voice the aims, aspirations and activities of the professional gardener, were addressing you, but in our profession we lack the sophistries of the politician and the platitudes of the office seeker. In our association we labor without remuneration, hoping that in the not distant future our humble efforts may lead to the placing of our organization and craft on a loftier plane.

I may fairly lay claim to being a representative professional gardener as were my father, grandfather and great-grandfather before me. I was born, brought up, and started my horticultural career in a beautiful garden, not perhaps unknown to some of you, Levens Hall, with its matchless topiary gardens located in Westmoreland, England, near the Scottish border, a land of mountain, moor, lake and forest, with enchanting scenery on every hand, enough to make anyone a lover of Nature, and particularly when he or she was born with a love of flowers in their veins.

My parents were sturdy Scotch people and greatly desired that I should follow the legal profession, but the love of gardening was too deep in my veins, and while today I may be poorer financially than if I had become a legal luminary, I have at least the satisfaction of knowing that the calling I am following gives more real pleasure to the lover of the great outdoors than any other I can name, and it is because I desire to see the profession of gardening more looked up to by all patrons of horticulture that I have for some years, in a very humble way, 'tis true, supported the excellent work being done by the National Association of Gardeners, of which my friend, Mr. Ebel, is the efficient secretary.

The professional gardener of today in America is very variable in type. I prefer today to speak of those who are well-trained gardeners, and not the large floating class of men who claim to be such, but whose limited gardening experience unfits them for filling any responsible position, however competent they may be in carrying out such duties as lawn mowing, pruning such deciduous shrubs as loniceras, spiræas and forsythias into topiary forms, planting and caring for some of the more common flowers and vegetables and doing the miscellaneous work customarily performed by men we class as choremen in New England.

The *real* gardener is one who has made gardening his life study here or abroad. The bulk of professional gardeners have at least some European training. This is advantageous as he is more likely to receive a thorough grounding in the rudimentary parts of the profession than here. American boys are singularly reluctant to follow a calling which may be beautiful and enjoyable, but cannot be learned in a year or two, no matter how bright and receptive the workers are. For this reason, commercial floriculture with its greater financial possibilities, landscape gardening and the mechanical trades are now taking practically all of our young men, a portion at least of whom we had hoped would have been training to fill the positions we older men must ere long vacate, and we must admit that in almost any other calling the learner secures a more adequate remuneration than in gardening.

I have had assistants in some cases purely unskilled laborers, who during the war made \$40 to \$75 per week in government work. Very few of these are returning to their old calling, now that more nearly normal conditions prevail, and in common with every man who has charge of a private estate I find it increasingly difficult to secure not only competent assistants, but laborers to perform the necessary work. Thousands of young gardeners joined the colors in the late European war and a large proportion were killed or maimed, and a decreasing number both here and abroad are taking up gardening as a profession. The "call of the wild" seems to be in the blood of many young men, and having helped to "save the world for democracy" they have greater visions and ambitions and seem unable to content themselves with so humble and humdrum a calling as gardening.

How can we change these things? How can we induce some of our growing youths to follow a calling which is at once ancient and honorable? All honest labor is honorable, we must admit, and can any work be more so than the tilling of the brown soil? What are some of the reasons that hold men back from following the profession of gardening?

1. It takes too long to acquire a knowledge of it which will bring the man (or woman) following it a moderate income.

2. The fact that the gardener's life is in many respects a quiet, not to say a lonely one, for a large part of the year must be considered. He is in many places situated long distances from towns, villages, churches, schools, railroads and places of amusement, and employers in many places are not very considerate in providing necessary locomotion to those thus situated.

3. The gardener of whatever degree he may be is classed as a domestic servant and oftentimes treated with but scant courtesy. He is expected to be on hand three hundred sixty-five days in the year, to labor long hours and uncomplainingly. He is criticised for small omissions often infinitesimal in character, blamed for crop failures and starved for want of a little encouragement for work well done.

4. The competent professional gardener does not as a rule receive compensation equivalent to services rendered. Since 1914 how few gardeners have been voluntarily offered a fair advance in salary! and are there not many penurious employers who have advanced salaries grudgingly and others who have threatened to close their establishments if any advance in gardeners' salaries was suggested?

5. There does not exist, unfortunately, that good fellowship which should exist between employers and employees. I presume you will admit that a competent gardener who takes pride in his work and studies his employer's wishes and interests should be treated with courtesy, consideration and kindness. A man who aims in every possible way to please his employers by introducing new plants and new features to add interest to the gardens under his care should, I consider, be treated with deference and respect.

Abroad such noted patrons of horticulture as the Duke of Portland, the Hon. Vicary Gibbs, Sir Jeremiah Colman, Sir Geo. Holford, Mr. Leopold de Rothschild, and others I could name are proud to call their gardeners friends and to refer to them as such at public horticultural functions. I feel that in this great republic where democracy is supposed to rule, we should not lag behind

any of the older lands in such formal matters as these.

It would help considerably if on estates where a number of men are kept, in addition to comfortable living quarters, a small library with horticultural and other works and some weekly periodicals were provided. I am glad this is done on some estates, others might profitably do likewise, the expense would not be great and such allowances would be appreciated.

I have referred to some of the drawbacks and discouragements which confront the professional gardener, and can you name any calling which requires a greater amount of care and forethought than gardening? The man who possesses a good knowledge of the culture of plants, flowers, fruits and vegetables under glass and outdoors, pruning, propagation, road making, lawn tennis and other forms of construction, tree surgery and how to fight numerous insect pests and diseases, and who can plan and plant shrubberies, flower, rock, wild and aquatic gardens and often more artistically than the highly paid landscape architects, must have skill of no mean degree, and often when as in an increasing number of cases he successfully cares for horses, cattle, sheep and poultry and houses hay, silage, ice, cereal and other crops, and in addition oversees the plumbing, painting, heating, lighting, carpentry and general construction work on a private estate, I believe we are all ready to admit that such a man merits a good salary, a much better one than he, in the majority of instances, receives today.

The serious question confronting us today is, where are the gardeners of the future to come from? All advices from abroad indicate that the great estates as a result of the war are employing far fewer men, also that few youths are entering the profession owing to superior financial inducements in other industries. Personally I have tried young agricultural college men and high school boys, but it has proved rather discouraging work. Boys were helpful the past two or three years, but alas! they who have seen the cities think gardening is prosaic, dull and uninteresting. A back to the land movement is necessary and is bound to come sooner or later, and if the professional gardeners, the National Association of Gardeners and your esteemed garden clubs co-operate, we will surely find some solution.

Horticulture has made good advances here of late years, and for the tired city man, manufacturer or merchant what is there in the world so fascinating, satisfying and stimulating as gardening? Shakespeare well said, "This is an art that doth mend Nature, change it rather, but the art itself is Nature." What joy there is to see the first snowdrops, crocus, winter aconites, scillas or Christmas roses unfold their flowers as the sun melts the last lingering snow covering them! What delights are ours as the procession of floral beauties unfold themselves before our eyes through Spring, Summer and Autumn until even when "Chill November's surly blasts make fields and forests bare" there are still in sheltered spots Japanese anemones and pompon chrysanthemums, dianthus, pansies, roses, and other hardy subjects with a secondary crop of flowers or some deciduous shrubs to cheer our hearts, and the added assurance that even though snow and ice may bury our beloved plants, they will grow, bloom and cheer us again in God's good season.

In this way do I look upon gardening as do many of my fellow gardeners, and I feel positive that the nearer we all get to Nature the richer our lives will be and the better you will appreciate the true worth of the professional gardener. I hope I have not wearied you. I have spoken plainly just as my heart feels. If I have

seemed somewhat pessimistic I am still a thorough optimist and hope I have given you a little insight of the drawbacks, discouragements, hopes and aspirations of the oldest, most honorable and most elevating of all callings, that of the true gardener.

(Address before Garden Club of America at its annual meeting, Colony Club, New York, March 17.)

THE RHODODENDRON

THE *Rhododendron* is admittedly the queen of hardy-flowering shrubs. During its main flower-season, late Spring and early Summer, it is one of the most brilliant and gorgeous of all flowering shrubs. It is, perhaps, seen to its best advantage when grown in huge colonies, as in the larger private gardens of the country. But even a single specimen is not to be despised when in bloom, whether grown in the mixed shrubbery, on the lawn, or in a tub.

Rhododendrons have a decided partiality for a peaty soil, or one containing plenty of humus. But peat is not an absolute necessity for growing these plants. They will thrive in a good, deep, well-drained loam or medium texture. Clay soils are too cold and damp to suit their requirements, and very light or sandy soils are by no means congenial for rhododendron culture. In the latter case plenty of leaf-mould and decayed cow manure is essential for ensuring healthy growth. Then, again, rhododendrons will not tolerate the presence of lime or chalk, so that it is quite useless to attempt to grow them in soils of a limy or chalky nature. It is advisable to prepare the soil thoroughly beforehand. For a single plant dig out the soil 2 ft. deep and 3 ft. wide, and if it be of a heavy nature, discard it, and fill the hole either with peat or with a mixture of loam, leaf-mould, and a little decayed cow manure. Where the soil is naturally a good loam merely trench two feet, and mix leaf-mould and decayed manure with it.

The *Rhododendron* is a compact rooting plant, and hence is more readily and safely moved than other shrubs. Plants have been successfully transplanted even when in flower, so that no one need hesitate to plant in May. The roots must be protected by hay or mats or sacking during the transit from the nursery, and directly after planting a good soaking of water must be given, and the foliage syringed every evening. Once established give the bed a mulching of decayed manure every May and an occasional application of weak liquid manure. Rhododendrons, moreover, must never be allowed to get dry at the roots, therefore water freely in dry weather. Make a practice, too, of removing the spent flowers to prevent seed formation. Rhododendrons do not, as a rule, flower freely every year, but every alternate year.

Rhododendrons do well grown in tubs 2 to 3 ft. wide and deep. Pots are not so suitable because they are apt to cause the roots near the interior to shrivel and die. Wood keeps uniformly moist, and hence suits the requirements of the roots. Put at least 6 in. of drainage in each tub, and over this a layer of decayed turf or peat, and then fill up with a compost of equal parts turfy loam, peat, leaf-mould, and coarse silver sand. Plant firmly. Plant any time in Spring. Great care must be taken to keep the soil uniformly moist, and when established weak liquid manure may be given once a week from May to September. The plants may be left in the open, no protection being necessary.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

May is the month of opportunities for the gardener, and owing to the cold, wet weather we have experienced during April, more work than ever will have to be crowded into this month. Seeds sown early last month have made but little progress, and are at this writing barely showing through the ground. In many places potatoes are not yet planted, and wherever possible this work should be pushed ahead with all possible dispatch. Succession planting of vegetables should be made. In doing this it is well to remember an application of lime, tobacco dust or soot will greatly assist in stopping the ravages of underground worms, which are very partial to root crops.

Seed pods should be kept off the rhubarb plants, and if you would have the crops continue over a long period don't omit feeding with liquid manure at frequent intervals, and during the hot weather apply a mulch of manure round the plants. Tomato stalks, or trellises should be put in place, and preparations made for setting out the plants as soon as all danger of frost is past in your locality. Egg-plants and peppers may also be set out this month, but caution here is necessary as these plants are very susceptible to cold weather, hence it is not wise to hurry them unless the weather is settled.

The strawberry patch should be given a thorough cultivation at this time applying, as the cultivation proceeds, a liberal application of fertilizer. After which the customary mulch of clean straw can be put on to keep the berries clean.

String beans may be sown regularly every two weeks to maintain a continuous supply. All sorts of pole beans may be planted at this time—the poles are always best set before the seeds are planted. A seed bed may be made up and used for sowing late cabbage, cauliflower, Brussels sprouts, and kale.

Watermelons, cucumber, and muskmelons can all be sown in the open, if one has not the benefit of a greenhouse or frame in order to get early plants to set out. Succession sowings of corn should be made, and lettuce and endive sown at short frequent intervals to maintain an unbroken supply of these succulents.

In the orchard spraying is the chief item on the calendar. Spraying of the fruit trees in the home garden so as to produce edible fruit of a high order is likely to prove a greater factor in helping combat the H. C. of L. than is likely to be appreciated by the average layman. Dusting instead of spraying has proved to be effective in controlling insect pests that attack our fruit trees, and is claimed by some authorities to be even superior to spraying. True, it is considered that dusting is somewhat more expensive in the quantity of material needed for each tree, but the greater number of trees that can be covered in only a fraction of the time required to apply the liquid spray, more than offsets the extra material required. In our opinion dusting will prove a boon to the home fruit grower with limited time to devote to his trees. With a hand dusting gun one can soon put in some effective work against the codling moth, and especially on the smaller trees. When the blossoms on the trees show pink is the time to get busy, and if you decide to try the dust use 90 per cent sulphur and 10 per cent arsenate powder, and figure about two pounds per tree. If the spray is preferred use lime sulphur solution

1-40, and 5 lbs. powdered arsenate of lead to 200 gallons water, and figure about 7 gallons of the liquid to an average size tree. This application should be repeated either as dust or spray when 90 per cent of the blossoms have fallen and again two weeks later.

Among the smaller fruits the currant worm may be kept under control by spraying with arsenate of lead, and it would be well to have some sulphide of potassium on hand to keep mildew on the gooseberries in check.

In the flower garden little has been done owing to weather conditions, which have held up growth, and consequently delayed planting and transplanting.

Any of this work that is contemplated should be pushed forward with all possible speed now, or the results of late planting may not prove very satisfactory. After the middle of the month bedding plants may be set out in many sections. It is well, however, to give some thought to the possibility of late frosts; we are as likely to have them as not, and one can easily have months of hard work ruined in a single night. When annuals have not been started in the greenhouse or frames seeds of all kinds may now be sown in the open ground; the more hardy ones early in the month, and the tender ones later. Morning glories, nasturtiums, and other annual vines may be sown at this time. See to it that all bare ugly places are covered with vines of some kind, there is a long list to select from, and a vine may be found for every location. As the early Spring flowers fade replace them with annuals, and sow more seeds to replace these as they pass their usefulness. *Achillea* cut to the ground as it finishes flowering will give a second crop late in the Summer. *Iris* should never be allowed to suffer for want of water. Remember it is a bog plant and demands an abundance of water when growing vigorously. Towards the end of the month a part of the golden glow may be cut down, which will cause the cut ones to flower a few weeks later than the others, thereby considerably lengthening the season. Have you thought of the roots and bulbs for May planting? There is a host of glorious flowers to be obtained by planting these now. The *Gladiolus* is easily the most popular and best known, but there are not a few others. *Cooperia Drummondii* offers a touch of white during the season when its coolness is most appreciated. The glorious tall Summer hyacinths, or more properly *Galtonia candicans*, with its white bell shaped flowers, *Bessara elegans*, *Eucharis*, *Montbretia*, *Ismene*, *Oxalis*, *Incarvilleae*, *Tuberose*, *Tigridia*, *Tritoma* and *Zephyranthus*, are all of the group of Summer bulbs, with which Summer effects may be had year after year with very little trouble.

Then we have the bulbous foliage plants, which are indispensable for bedding work and formal effects. Of these the *Canna*, Elephant's ear (*Caladium esculentum*) and *Phrynium* are the most reliable standbys. Then again we have the Summer flowering lilies, which form a group by themselves. *Heemerocallis* and *Funkia* (the day lilies) may be included with the true lilies—*curatium*, *tigrinum*, *speciosum* and others. All these can be purchased and planted now.

Don't wait too long before cutting the lawn. You may be busy as can be with other things, but remember it will improve the appearance of the place generally if the lawn is gone over with the mower in good time.

Lawn-making and repairing bare patches should be completed forthwith. Evergreens that are being kept shaped should be gone over with the shears just as the growth starts. Plantations of evergreen can still be made, and the work should be pushed ahead with all possible speed, before active growth starts, or much of the young growth may suffer from the effects of transplanting. Deciduous shrubs and trees may still be planted, and as the majority of them are now either in leaf or bursting buds the planting should be completed at the earliest possible moment. Early flowering shrubs should be pruned as soon as they are through flowering.

A heavy mulch of manure applied to the rose beds will be of great benefit to them in the form of better quality flowers, and while mentioning roses we might say that it is not too late to have a rose garden this year.

If prompt action is taken one may enjoy an abundance of blooms next month. Good strong field-grown plants potted last fall are obtainable at reasonable prices. They will be in full growth when you receive them and ready to go right ahead, and flower freely if planted with reasonable care.

With much of the bedding stock out in the frames hardening off previous to planting out, there will be an opportunity of preparing for next Winter's supply of cut flowers. Carnation plants should be set out in the field, and kept pinched, and cultivated regularly. In the meantime the house they are to occupy may be cleaned, and painted in readiness for them. Cleanliness is an important factor in the cultivation of winter flowering plants, and success in a measure depends upon the preparation of the house. This is even more true of roses, and the benches the plants are to occupy, should be thoroughly cleaned and painted with hot whitewash, before putting in the new soil. Remember too that a very great deal depends on the quality of the soil. Sod that has been stacked for a year or two is to be preferred if one has a choice, but if not freshly cut sod from an old pasture, when well broken up will suit roses very well.

Hard-wooded plants such as *Genistas*, *Acacias*, etc., should now be placed in a protected place outside where the wood will ripen. Begonias, Gloxinias and other flowering plants grown in the greenhouse during Summer should be fed freely. Cyclamen and primulas may be placed in a cold frame and slightly shaded. A batch of English frame cucumbers may be grown in the greenhouse during the Summer. Chrysanthemums should be potted on as required. Keep them growing right along, for once checked they never produce first class flowers.

Melons for Summer forcing should be started at once.

SALVIAS FOR THE GARDEN

S. R. Candler

VERY few groups of plants are so little known and appreciated for their use in the garden as the Salvias. These belong to that well known family of plants, *Labiata*, from which we are supplied with so many gems of the garden.

The four Salvias I wish to speak of as of special value for their utility and easiness of culture are:—*Salvia farinacea*; *S. uliginosa*; *S. azurea grandiflora* and *S. patens*. All are herbaceous perennials but shall be treated as annuals with the exception of *Salvia azurea grandiflora* which, although a native of Mexico, is perfectly hardy.

Salvia farinacea. The seeds should be sown in the hot bed or in the warm greenhouse about the end of March, and as soon as the seedlings are large enough to handle should be pricked off into boxes about 3 inches apart; these seedlings should be kept growing in a

warm temperature and gradually hardened off till they are ready to be planted in the open ground in May, when they should be planted in a good soil with a sunny location, about 18 inches each way apart. In July they will be one mass of lavender blue flowers.

The great beauty of this plant is in the flowers, as the corolla and the calyx are of the same color, and when the former drops the calyx remains and gives the appearance of a sprig of the English Lavender (but lacks its perfume). *Salvia farinacea* is of importance as a cut flower; it lasts a long time when cut and placed in water, but it should always be planted for effect in bold masses.

Salvia uliginosa. The seeds and seedlings should have the same treatment as *S. farinacea*, but with this difference: the plants should always be allowed two feet each way when planting and should have a well manured soil; they also like a dry location.

This *Salvia* is the last of the Salvias to come into flower but it continues to flower till late fall; it will grow to a height of 4 to 5 feet and therefore should not be planted in front of the border but at the back. It is a most profuse bloomer and the flower tresses are from eight to ten inches in length and are of a pretty cornflower blue with a little white in the throat, a most distinct color in Salvias. No *Salvia* is so useful for massed effect in the border, and while it is a good cut flower it does not equal *S. farinacea* in that respect.

Salvia azurea grandiflora. In the seedling stage this plant requires the same treatment as the above mentioned, but once you have a good supply it will remain with you as the roots are perfectly hardy and the plants will increase in strength from year to year. The habit of this plant is not so free as the two already mentioned, the stems are more woody and stiffer and the flowers are not borne with such profusion, but still it is a very worthy subject for the garden and vase, as a single stem of flowers forms quite a show of blooms. It is its color that appeals; it has a blue that is lighter than any other blue in the garden, with the exception of a few Delphiniums. It should be planted not for massed effect, but rather to increase the color scheme of the border and therefore six or twelve plants, planted in clumps every little distance in the border has a very pleasing effect.

Salvia patens. This plant requires a little more heat in the seedling stage and when possible should be worked into pots before planting out, so as to form strong individual plants, as the habit of this plant is to send shoots or stems from the crown, and does not branch like *S. uliginosa* and *S. farinacea*, so therefore the stronger the crowns the more flowers will be produced. The plant produces herbaceous roots and where possible it should be taken up in the Fall, potted and kept in a cool greenhouse all Winter; in this way other strong plants are formed and the true character comes out the following season.

It should be used more as a bedding plant than as a cut flower plant as the flowers do not stay long when cut, but when left on the plant the flower stems continue to grow in length and as soon as one flower falls another is formed, thus keeping up a continuous mass of blooms the major part of the summer months. To be effective it must be massed and if used with *Hunnemannia fumariifolia* it makes a good combination.

The flowers are of a dark blue and have a very large lip, also blue in the throat and are borne sparingly on a long stem.

The Salvias mentioned above are types that can be raised in any garden where there is a hot bed and cold frames; they are simple in culture but rich in effect and utility, and are worthy of a place in the garden of all plant-lovers.

A Lesson on Growing Good Muskmelons

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

As used in this country, the word melon is applied to two distinct species of *Cucurbitacea*, the muskmelon and the watermelon, both having originally come from tropical Africa and southern Asia, the former being a variety or subspecies of *Cucumis melo* and the latter of *Citrullus vulgaris*. There are three types of the cultivated watermelon: the round preserving "citron," the live-stock melon, and the ordinary watermelon; the forms found on the southwestern prairies and in the southern cotton fields have returned to their original wild condition.

There are very many cultivated forms of *Cucumis melo*, which may be divided into three groups: the musk-scented forms, including the nutmeg or netted melons and the cantaloupe or hard-rinded melons, although some people apply the word cantaloupe to all muskmelons; the relatively non-odoriferous winter melons, known as *Cassaba*, which of recent years have been grown extensively in California and which are shipped by the carload to the eastern markets during November and December. One distinct feature of the *Cassabas* is that they will keep several weeks after ripening if they are properly handled. This type is native of the Mediterranean district. The third group comprises species used for preserves and condiments and also some which are grown for ornament and are never eaten in the ordinary manner, of which the *Chito* and *Dudaim* types are examples.

The requirements for growing all the different species and varieties of melons are practically alike, but our remarks will refer especially to the muskmelon proper.

Quality is the thing most sought for in growing muskmelons, and often the most lacking. Having frequently heard both professional and amateur gardeners voice their difficulties and want of success in producing muskmelons worth eating, it appeared that this would be the most fitting season to deal with the subject. As with practically everything else, a melon from one's own garden should be better flavored than any which can be brought in the market, because for market purposes where the product has to travel any distance the melon must be gathered before it is quite ripe and before it has reached the limit of its potentialities as regards flavor. The muskmelon, while obtainable in the markets, from the Californian ones in May to those from Michigan in October, is productive for only about ten weeks in northern gardens; but for this or even a shorter period it is worth while to grow them if possible in the smallest garden.

It is sometimes said that melons take up too much room in a small garden, especially for the short period they are in fruit; a statement with which we must take issue.

While the preparation of the ground to be occupied by them should be finished a week or two earlier at least, it is rare, in the latitude of New York, that conditions for sowing are suitable before the last week in May. By the time August arrives a muskmelon patch will be from eight to ten feet wide, but it is not necessary for this space to be entirely set on one side for them during the whole season. A space two feet wide is all which is necessary to leave if the melons are grown in a continuous row, or if in hills then the hills will occupy only two square feet with a five-foot interval. These intervals, together with the rest of the ground on the sides which the melons will ultimately require, can be made to produce a crop, so that the melons would only occupy their entire ground for a couple of months, as it would be a few weeks before they would spread very much. Things like early peas, lettuce, spinach, and even the first string beans, would all mature before the melons required the whole of the ground.

One sometimes hears or reads statements about muskmelons demanding a particular type of soil, but this is not so, as they can be grown upon any kind of soil suitable for any other garden crop, provided it is well drained, adequately fertilized and thoroughly cultivated.

After successfully growing melons for a number of years, I have found that good quality of fruit depends upon obtaining a perfect vine. A perfect vine will be one that is started right, fed right and taken care of from start to finish, so that there will be no check in its growth.

The first thing is preparing the ground, and this can be done as long a time before the time for sowing the seeds as convenient; the longer the better, as after the preparation is finished there will be an opportunity for weed seeds to germinate, and the necessary subsequent continual hoeing will render the soil practically free from weed possibilities when sowing time

arrives. While some plant in rows, I have found the hill system better. For private gardens I do not know of a better variety of melon than the Emerald Gem, for which the hills may be as close as six feet apart. However rich the soil may be, it is difficult to supply too much of the proper food to each hill.

The first requirement of melons is plenty of humus, which is best supplied by well rotted stable manure. At the place where each hill is to be taken out the soil two feet square and nine inches or a foot deep, according to the quality of the underneath soil, and thoroughly break up the subsoil at the bottom of the hole. Fill the hole with rotted manure, chop it down with a spade and return the soil taken from the hole on top of the manure. This will form a cone. With the top soil mix one pound of sheep manure and one pound of the finest ground bones; if at all lumpy chop it up with a spade and leave the surface, about fifteen inches square, flat. This work should only be carried out when the soil is comparatively dry and not sticky. Cultivation should be continuously kept up, and as the vines grow, more soil should be drawn around the hills so as to increase their size and capacity for holding moisture. For cultivating close to the plants the short hand cultivators are useful, as one can carefully lift the vines with one hand and use the tool with the other.

Should the rotted stable manure be unobtainable, then instead of making the hole, the hill can be formed of the surface soil and a peck of sheep manure and two pounds of fine bone meal mixed with each hill. While these feedings will under ordinary circumstances be sufficient, should June be cold and wet after the plants have started, an application of nitrate of soda spread over each hill after the plants have been thinned, not allowing it to touch them, will help them along. For this purpose two tablespoonfuls to each hill will be sufficient at one time, a dose which may be repeated in two weeks if necessary.

The next point is the planting of the seed. It must be emphasized that we are speaking of the more northern part of the country, where success with all the more or less tropical plants is eternal vigilance. It is useless to sow the seeds before the ground gets warm and the weather conditions generally suitable, which conditions do not usually arrive before the last week in May. Hardy plants, such as cabbage and onions, during cold wet weather make root growth and get stronger, and when warm weather does come are that much ahead, but if the melon seeds germinate at all the young plants rarely recover properly from any severe check, although they may not be actually killed. It is well to sow plenty of seed so as to be sure of a full stand of three or four plants to a hill after thinning: about ten or twelve seeds to a hill, spread over a square foot of the top, is generally sufficient, covering with half an inch of soil.

After sowing cover the top of the hill with tobacco dust. This prevents the ravages of cut-worms and the striped beetles, and it also acts as a fertilizer. In addition, aphids are sometimes troublesome. These are checked by dusting the entire plants with land plaster (sulphate of lime) and paris green, also by the use of some of the tobacco solutions advocated for aphids; in either case it is necessary to cover the under sides of the leaves as well as the upper. Another possible trouble is a fungus disease known as "wilt," which clogs the sap tubes and which may cause the death of the entire plant. This disease is more likely to appear and spreads more rapidly when striped beetles are allowed to be present, as the disease can enter more readily through the wounds made by the beetles. Another fungus disease likely to appear causes a blighting and yellowing of the leaves.

The control of these diseases must be primarily along the lines of prevention, and in this connection it is well to spray the hills after the seed is sown with a reliable fungicide and to continue the spraying every ten days after the plants appear. In wet seasons it may be necessary to spray more frequently, while the interval may be extended during very dry periods. The effect of these diseases is liable to become apparent in a sudden manner, although they may have been working for some time. At this stage efforts at combating are generally useless. The only way to control any fungus disease is to look upon fungicides as insurance and use them before the disease appears, so as to keep the disease away; therefore we must begin early and do it well. Effective spraying is only done by thorough work.

While melons are naturally affected by adverse weather conditions, which are outside the control of the grower, still the effects of such conditions, whether they are due to extreme drought or extreme wet accompanied by unseasonable temperature, are reduced almost to the vanishing point when the soil conditions as regards humus, cultivation and drainage are all that they should be.

Another point in obtaining earlier and better melons is to pinch back the runners. As soon as the first runners reach a growth of about fifteen inches the tips should be pinched off. In a few days laterals will be formed and very soon a tiny melon will appear, while, if the experiment be made, it will be found that melons will not appear upon the unpinched runners until two weeks later, and many more will set earlier and therefore ripen than when the method of pinching is not practiced. It will be necessary to go over the patch several times in carrying out the pinching back process.

A method of obtaining earlier melons by starting the plants under glass is sometimes adopted. As a melon plant is likely to die, or to be checked so as to be useless, if its roots are at all disturbed, it is necessary to sow the seeds in pots or in what are called "dirt-bands," which are paper pots without bottoms, and very carefully handled during transplanting. When dirt-bands are used they are allowed to remain upon the plants when setting out. The dirt-bands should be from two to three inches each way, which size will hold one plant. They should be placed in a flat and filled up to within half an inch of the top with fibrous, sandy loam, and three seeds sown in each. Fill up the bands and water. Place the flats with bands in a hot-bed and keep covered closely until germination. As soon as started, give air and aim to have the plants strong and sturdy. After the second leaves are well formed thin out to one plant to each band. This is best done by cutting off any requiring to be removed with scissors. Water carefully. When first sown the bands should be soaked and then not watered again until on the dry side. Plants grown in these bands generally requiring watering less frequently than when grown in pots. It is not advisable to sow the seed in bands before the tenth or twelfth of May, as they should not be planted out before the first week in June, and if they have to remain too long they are liable to become checked and little will be gained by the process. A warm still day should be chosen for planting out, and if the plants are well wetted before, they will not notice their removal from the flat to the soil. Three of the plants should be placed in each hill.

In summing up the subject, to produce good melons they must grow steadily from start to finish, and to do that they must be started right, fed right, kept free from pests and disease, pinched back to form early fruit, so as to ripen the crop ahead of bad weather, which frequently catches a late crop.

BOOK REVIEW DEPARTMENT

THE AMERICAN ROSE ANNUAL FOR 1920, edited by J. Horace McFarland; 24mo., cloth, 188 pages, including an index, with 17 plates in sepia and 3 in colors.

This excellent work magnificently performs its primary function of making the members of the American Rose Society acquainted with "rose progress the world over." The devotees of the Queen of Flowers are indeed fortunate in having the editor that they have, a man thoroughly expert from study and practice of the subject and always wide awake not only to elicit and to stimulate information for his readers but also to interpret and to apply and to correlate it into helpfulness. Any person who may attempt to grow but a few roses, the generally most difficult to manage as it is the most universally loved flower, should quickly find, by giving attention to this book, ample reward for investing in a membership in the Rose Society. The cost of the membership fee would be made up to him by his being guided in the purchase of only one or two plants. And his interest would be inspired and his horizon enlarged by learning of the "labor of love" that Doctor Walter Van Fleet, Captain George C. Thomas and others are performing particularly in their effort to produce an ever-blooming rose-bush that shall be finely ornamental and entirely resistant to disease.

Indeed should every one who grows roses—and who grows roses without growing flowers?—send to Mr. E. A. White, the secretary, at Ithaca, N. Y., without further delay, two dollars for membership in the American Rose Society and obtain a copy of this book.

* * *

PRODUCTIVE SMALL FRUIT CULTURE, by F. C. Sears, M. S.; large 24mo., VII+368 pages, with illustrations and index; cloth; the J. B. Lippincott Company, Philadelphia and London.

The latest of more than a dozen very attractive and valuable Farm Manuals, most timely brought out by a house always keen to supply the much needed works of this kind, is almost timely one indeed. Newly aroused appreciation of the salutary and economic worth of closer contact with the earth, the great Mother, in order to derive our natural nourishment from her breast, is now fast to become prevalent. Concerning the rank of fruit in value as food the author shows that the small fruits approximate, pound for pound, the worth of milk and potatoes, while dried fruits average nearly double the energy value of eggs and the most nutritious beef. And they supply in most enticing form and in form conveniently preserved for use throughout the year, an essential part of the body's needs that is not afforded by the more solid food stuffs. And fortunate it is for the hope of the future that for various reasons, if not for these alone, the small fruit plants are being planted much more generally than ever before. That they occupy so little space and come into bearing so quickly is being realized, as it ought to be, by the householder who has any garden at all. The designers of private grounds and of gardens should take this into account and every man and woman engaged professionally in work of this kind ought at once to obtain a copy of this book. It is particularly designed for "the instructor who is conducting classes in small fruit culture and the practical grower who has not yet mastered all the details of the business, but who wants suggestions on some of the many points which are constantly coming up for decision on any fruit farm." This purpose is accomplished eminently well, and for these classes it is an eminently successful work. But it is adapted to meet the needs of the home garden also. The complete and satisfactory index enables one readily to find the treatment of any topic. Yet the various parts, the one given to selection of sites and to the subject as a whole, as well as the parts devoted to strawberries, raspberries, blackberries, currants, gooseberries, and grapes individually, are all worth reading entire as literature. With study and practical experience in the west and in New England the author, now Professor of Pomology in the Massachusetts State Agricultural College, writes with full understanding of varying climatic conditions.

The illustrations are many and are clear. The press work seems to be perfect. It is to be hoped that a similarly helpful volume will soon be available to guide in the management of dwarf fruit trees and to advise persons other than those who make the growing of fruit a business.

* * *

COLOUR IN THE FLOWER GARDEN, by Gertrude Jekyll; cloth, 16mo., XII+148 pages and inserts, with 116 illustrations in black and white and index; "Country Life," Ltd., London, England.

Although not a new book it is so notable that, now that the war is over, mention of it here may not be out of place. It is what might be expected to result from an extraordinary passion for beauty of leaf and flower, an artistic sense of degree rarely possessed and a life-time experience in fine gardening. From no other combination could arise a work of such value in inspiration, inspiration for the average amateur and professional, as well as for the few who can garden most exquisitely and very expensively. For only the last class can a work like this be of great practical worth. Those who are confined to the limits of a rather small garden or whose work as professional caretakers of large estates is diversified may find but few suggestions to carry out. American readers not living in the mild and moist Pacific coast regions must bear in mind the caution with which the writings of English gardeners are always to be read by them. Yet a number of the color harmonies may well be reproduced in almost any garden in the temperate zones. The principles of course hold everywhere. The author's ideas concerning form in planting, to which one brief chapter is entirely devoted, seem all to be artistically correct; instead of broad blocks, each of a certain plant, with eminent wisdom she advocates what are not ineptly called drifts.

The plans and charts are neatly executed. The illustrations, a large number of which, by the way, ought to be in colors, are excellently clear and well done.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

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National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

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D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.
M. C. EBEL, *Secretary*, Madison, N. J.

Trustees for 1920

Peter Duff, Orange, N. J.; William Waite, Rumson, N. J.; Arthur Smith, Elberon, N. J.; Robert Weeks, Cleveland, O.; William H. Griffiths, Detroit, Mich.

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(To serve until 1921)—William N. Craig, Brookline, Mass.; William Hertrick, San Gabriel, Cal.; William Gray, Newport, R. I.; G. Hennenhofer, Great Falls, Mont.; Thomas Hutton, New London, Conn.; Albin Martini, Lake Geneva, Wis.; A. C. Jordahn, Palm Beach, Fla. (To serve until 1922)—George Wilson, Lake Forest, Ill.; James Stuart, Mamaroneck, N. Y.; William Kleinheinz, Ogontz, Pa.; John F. Huss, Hartford, Conn.; Edwin Jenkins, Lenox, Mass.; Carl N. Fohn, Colorado Springs, Colo.; Joseph Tansey, Tuxedo Park, N. Y. (To serve until 1923); Robert Williamson, Greenwich, Conn.; Robert Cameron, Ipswich, Mass.; Theodore Wirth, Minneapolis, Minn.; George H. Pring, St. Louis, Mo.; George W. Hess, Washington, D. C.; Daniel J. Coughlin, Locust Valley, L. I.; John Barnet, Sewickley, Pa.

ANNUAL CONVENTION AT ST. LOUIS

The annual convention of the national association will be held at St. Louis, Mo., on September 14, 15, 16.

The local arrangements committee consists of L. P. Jensen, George H. Pring, John Moritz, Louis Baumann, S. M. Beers, A. Lindahl, H. C. Irish, and H. M. Shaff.

More complete information regarding the convention, its headquarters, program, etc., will be published in the next issue of the GARDENERS' CHRONICLE.

SUSTAINING MEMBERS

Daniel Guggenheim, Port Washington, L. I. (Thomas Leyden, superintendent); August Busch, St. Louis, Mo. (L. P. Jensen, superintendent); Frank J. Dupignac, Mamaroneck, N. Y. (John Henderson, gardener); H. B. Howells, Suffern, N. Y. (Thomas Hambleton, gardener); C. H. Hutchins, Shrewsbury, Mass. (Walter J. Dack, gardener); William Ziegler, Jr., Noroton, Conn. (A. Bieschke, superintendent); Mrs. Manuel Rionda, Alpine, N. J. (E. T. McCarroll, gardener); have become sustaining members of the association.

Members are again appealed to to interest their employers in the association and its aims by inviting them to become sustaining members. The secretary will be glad to address any employer on the subject, if requested to do so by a member.

TO INTEREST YOUNG MEN IN THE PROFESSION

The committee appointed at the Cleveland convention last year is completing its plans to begin a campaign to arouse the interest of young men in the profession of gardening, and requires the co-operation of members in locating young men whom it may interest. Any members who can provide for one or more apprentices, at a salary to start of \$40 a month and board, should communicate immediately with the secretary of the association.

NEW MEMBERS

The following new members have been recently added to our membership list: Robert E. Harrison, James A. Reburn, Marshall Crisman, Mt. Kisco, N. Y.; John C. Gillespie, Katonah, N. Y.; E. Parker, Portchester, N. Y.; John Corbe, New Rochelle, N. Y.; Henry Kuenzel, Yonkers, N. Y.; William Klein, Clayton, Mo.; John Cumming, Tarrytown, N. Y.; John D. Boyd, Newport, R. I.; Monroe S. Fraenkel, Yonkers, N. Y.; Carl Peterson, Riverdale, N. Y.; Phillip M. Kurlich, Fairmont, W. Va.; Percy L. Jeffrey, So. Dartmouth, Mass.; John H. King, Irvington, N. Y.; Frederick Hollenden, Brooklyn, N. Y.; Even Livingston, Sewickley, Pa.; William Whitton, Greenwich, Conn.; Robert Cochrane, Mt. Kisco, N. Y.; Nicholas Tabb, New York City; Carl H. Swanson, No. Easton, Mass.; William H. Howell, Madison, N. J.; Tom J. Bulpitt, Mamaroneck, N. Y.; William G. Ellis, John Dowsett, Peter Hunter, Glen Cove, L. I.; Alexander Golon, Roslyn, L. I.; Joseph Karel, Glen Head, L. I.; Paul B. Lenchiski, Port Washington, L. I.; P. H. Radford, Noroton Heights, Conn.; John Alexander, Clifton, Mass.; James H. Andrews, Joseph C. Stobo, Ragnar Steinick, Oyster Bay, L. I.; John J. Madill, Huntington, L. I.; William Barron, New York City; Edward H. Roerke, Tuxedo Park, N. Y.; Daniel J. Marleman, Manhasset, L. I.; David Starke, Kearney, N. J.; Henry Winters, Lincoln, N. J.; Jonas Bernhard, Englewood, N. J.; Charles M. Lind, Rumson, N. J.; John D. Watson, Beloit, Wis.; Irving H. Stewart, Milton, Mass.; J. Vilh. Gudmund-Hoyer, Morris, N. Y.; Robert Dunbavin, Bloomfield, N. J.; Herman Hoyer, Waterford, Conn.; Romeo M. Guido, New York City; Hjalmar Berger, Rockville, Conn.; Henry Moore, Niagara Falls, Canada; E. Hlasek, New York City; A. Thunberg, New Rochelle, N. Y.; Edward Kozicki, New York City; Alexander Douglas, Yonkers, N. Y.; George Petrie, Scarborough, N. Y.; George H. Ward, Great Neck, L. I.; Hobart M. Van Wormer, Claire Trisbee, Cleveland, O.; John

Burke, Yonkers, N. Y.; James H. Linanc, Pelham Manor, N. Y.; Alfred E. Townsend, Tuxedo Park, N. Y.; Frederick Crawford, Brooklyn, N. Y.; Whyland T. Crosby, New York City.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received towards the Service Bureau Publicity Fund up to April 30th:

Previously acknowledged	\$1,164.00
William Barron, Maplewood, N. J.	5.00
John Dunne, Purchase, N. Y.	5.00
Charles Swain, Chester, Mass.	5.00
J. C. Gillespie, Katonah, N. Y.	5.00
Robert Melrose, Mt. Kisco, N. Y.	12.00
Stephen Treglow, Framingham, Mass.	2.00
Thomas H. Webber, Marion, Mass.	2.00
Robert Davidson, Port Washington, L. I.	5.00
Thomas W. Head, Lake Forest, Ill.	20.00
Bruno Sitzenstok, Egg Harbor City, N. J.	2.00
Irving Stewart, Milton, Mass.	2.00
John Carman, Sewickley, Penna.	5.00
Charles Kurz, Sewickley, Penna.	2.00
H. F. Bulpitt, Port Chester, N. Y.	10.00
Wm. J. Sealey, Port Chester, N. Y.	5.00
William Weigel, Port Chester, N. Y.	5.00

Total..... \$1,256.00

AMONG THE GARDENERS

H. F. Bulpitt has accepted the position of superintendent on the estate of Mrs. H. Mallory, Port Chester, N. Y.

Peter Stroyan has resigned his position of superintendent on the C. O. Iselin estate, Glen Head, L. I., to accept a similar position on the Gifford Pinchot estate, Milford, Penna.

Fred Falconer has accepted the position of superintendent on C. O. Iselin's estate, Glen Head, L. I.

Auguste Fournier has accepted the position of superintendent on Paul D. Cravath's estate, Locust Valley, N. Y.

John D. Wilson has secured the position of gardener on the E. C. Conyer's estate, Conyer's Manor, Greenwich, Conn.

Frank E. Ehrler has accepted the position of gardener on the estate of S. H. P. Pell, Fort Ticonderoga, N. Y.

A. D. Hutchison has accepted the position of gardener to F. Presby, Norwalk, Conn.

John Mair has accepted the position of superintendent on the A. K. Luke estate, Devon Hall, Irvington-on-Hudson.

Jerome B. Murphy has accepted the position of superintendent on the estate of Charles J. Liebmann, Mamaroneck, N. Y.

T. F. Eastwood has accepted the position of gardener to Mrs. H. R. Rogers, Garrison, N. Y.

Stephen Bernath accepted the position of gardener to Edwin Isham, Brielle, N. J.

William Anderson, secured the position of gardener with A. W. Mellon, Pittsburgh, Penna.

Carl Peterson has secured the position of gardener to John G. Ager, Premium Point, New Rochelle, N. Y.

P. H. Radford secured the position of gardener to Gustav Schwab, Greenwich, Conn.

Victor Olsen secured the position of gardener to W. H. Seely, Pleasantville, N. Y.

Philip J. Lucking has secured the position of gardener on the K. C. Billings estate, Farnsworth, Oyster Bay, L. I., succeeding Auguste Fournier.

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LOCAL SOCIETIES

PENNSYLVANIA HORT. SOCIETY

The last lecture of this season's series was given on Tuesday last, by Professor A. C. Beal, of Cornell University, the subject being "Gladioli."

Professor Beal began his lecture with a very clear history of this useful class of bulbous plants, starting with the varieties found in southern Europe and those found in South Africa; giving an account of the work done in France and Holland in hybridizing; detailing the work done and results accomplished by European growers until the introduction of *Gladioli* into this country, a list of the principal growers, who have been working in hybridizing in this country and showing the results they had obtained. These remarks were illustrated by some well colored slides, first showing the older varieties and then those produced by hybridizing from these varieties leading on to the grand varieties that have been produced in the middle West in the past few years. In closing his lecture, some five or six slides were devoted to the decorative uses of *gladiolus* in planting around the house and as cut flowers in the house.

The exhibits staged at this meeting were of the usual high quality. Those deserving special mention being some specimen *Calceolaria hybrida* exhibited by A. B. Johnson, Rosemont, Pa., Wm. Comfort, gardener. These plants were in 8-inch pots, foliage standing 18 to 20 inches above the pot, the heads of the plants being about 26 inches in diameter, completely covered with well



A Bug On Bay Trees

Not that there are any bugs on our bay trees, but that Julius says I am "a bug on the bay trees that are ours." And why shouldn't I be; didn't I go to the other side last Spring and pick them out?

Haven't I been chucking them under the chin ever since they landed here? Didn't some of the biggest landscape men in the country come and snap up a big snag of them? Hasn't everybody who has seen what's left, said they believed them the finest lot in captivity?

Furthermore, they are in better shape now than they ever were, and of course worth more. Just as everything else is, that ever was worth anything.

Knowing how scarce well-grown, full-shaped trees are, looks like these trees of ours are worth looking into.

Julius Roehrs

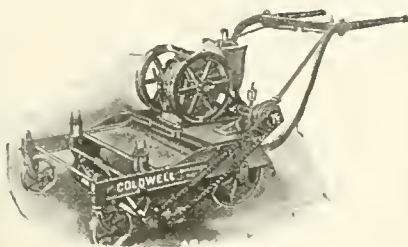
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finished flowers. A collection of cut flowers of *Gerbera*-hybrids (South African Daisy) was exhibited by Mrs. E. V. Morrell, Torresdale, Philadelphia, Thos. Roberts, gardener. There were 21 colors represented in this collection of flowers, the flowers ranging from 3 to 5 inches in diameter. A collection of *Antirrhinum* (Giant Flowering) was exhibited by Mrs. S. T. Bodine, Villa Nova, Pa., Alex. MacLeod, gardener. The flower stems were about 4 feet tall, and the spike of flowers measuring from 18 to 24 inches.

DAVID RUST, Sec'y.

WESTCHESTER AND FAIRFIELD HORT. SOCIETY

The regular monthly meeting of the above society was held in Greenwich, Conn., April 9. In the absence of President Andrews, Vice-President Harry Jones occupied the chair. Two proposals for membership were received and one member was transferred to Nassau County Horticultural Society. The event of the evening was the presentation of the silver medal of the National Association of Gardeners to Robert Williamson for the highest number



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of points secured during the past year. James Stuart gave an interesting description of the Boston flower show, comparing some of the exhibits with those shown at the New York International Exhibition. Mr. Stuart and Mr. Morrow were congratulated on the fine exhibits they made at the New York exhibition. The labor question came up for considerable discussion. It is humiliating to find that Italian and Polish laborers are receiving higher wages than the professional gardener. On the motion of Mr. Seeley the question of holding a Summer flower show was left over until our next meeting on May 14. Prizes from the John H. Troy and A. N. Pierson fund will be awarded for exhibits, and a general discussion will be brought up on matters concerning the gardening profession. Mr. Whitton and his committee received a hearty vote of thanks for the concert and dance held at Greenwich March 23.

JACK CONROY, Cor. Sec'y.

ST. LOUIS ASS'N OF GARDENERS

The local gardeners met Wednesday evening, April 7, it being the largest attended meeting in the history of the organization, the number totaling seventy-five. The scheduled lecture, "City Garden Design," was presented by Hugo Schaff, superintendent of the city school grounds. The speaker dwelt on varied designs conducive to school environments, especially those plants best adapted to city conditions, such as smoke, gas laden atmosphere, etc. Lantern slides were shown illustrating recent schools under construction and again after the execution of planting with trees, shrubs, etc.

A general discussion followed on the damage by the recent frost, the press quot-

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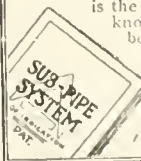
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ing various authorities that all fruits had been killed. The consensus of opinion of those present was that all fruits with few exceptions, were not killed. A few tender plants such as *Magnolia*, etc., however, have lost their flower buds.

A drawing followed with the first prize, a quilt, donated by A. Huber, and six other valuable prizes, to increase the convention fund. Under the guidance of E. Strehle \$175 was placed to the fund for showing the attendant convention members a regular St. "Louie" time.

G. H. PRING, Cor. Sec'y.

TARRYTOWN, N. Y., HORT. SOCIETY

The regular monthly meeting was held March 27.

John Maier was elected vice-president to succeed Thomas J. Morris, our esteemed late vice-president. In his death the society lost a worthy member and a successful exhibitor. This being gardeners' night, all business was soon concluded and the balance of the evening devoted to a good social time. The entertainment committee provided a smoker, with light refreshments. There was not a dull moment after James McDonald started things going with the bagpipes. CHAS. J. WOOD, Rec. Sec'y.

STAMFORD, CONN., HORT. SOCIETY

At the meeting held March 31 the members responded generously to the last call for the \$14,500 drive, required for their hall. The loan was not only oversubscribed but enough money was received from the members to make sure the ladies will be seated at the opening. The president, Henry Wild, and the building committee deserve all the credit for their energetic work. The meeting was well attended and with the mass of exhibits one hardly would believe we just turned our backs on the hard Winter we had. The members, not only by words but by deeds, are showing what the society stands for: "Efficiency Assures Success." Twenty-one new members were elected and one honorary member. Following were the awards for the evening.

G. C. BROWN, Cor. Sec'y.

BERNARDSVILLE HORT. & AGRI. SOCIETY

This society will hold its eighth annual exhibition on September 3 and 4, 1920, at the Liberty Theatre, Bernardsville, N. J.

CLAYTON D. OLIVET, Sec'y.

NASSAU COUNTY HORT. SOCIETY

The regular monthly meeting was held in Glen Cove on April 14. President Thomas Twigg occupied the chair. Joseph C. Winssocki and Robert Purcell were elected active members and five petitions for active membership were received.

A letter was received from the Park Garden Club inviting the society to attend the Iris and Tulip show to be held at Flushing, L. I.

Mr. Van Ginover of Holland and Mr. Sperling of New York were present, and both of them gave short but interesting talks.

This was one of the best meetings ever held by the society, both in attendance and in exhibits. ARTHUR COOK, Cor. Sec'y.

NORTH SHORE, ILL., HORT. SOCIETY

The above society held its regular monthly meeting April 11, a very large attendance being present. Mr. Scott of La Grange, Ill., gave a very interesting and practical talk on the moving of big trees,



A Pool of Lilies — What Could Be Better?

When the pool is well arranged the blooms and thick pads of water lilies form the most attractive drawing card a park can possess. People will always stop to examine and admire the delicately tinted blooms.



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Mention the "Gardeners' Chronicle" and ask for a sample copy.

MADISON COOPER, Publisher
CALCIUM, N. Y.



pointing out very clearly the most essential methods to follow, and the soil the tree should have to start in new growth. He also made some remarks on the pruning of shrubs and landscaping. His talk was to the point and highly appreciated by those present. Carter H. Fitzhugh of Lake Forest spoke of the advance made in cold storage and root cellars and described the several methods used in the different States of the Union. Mr. Fitzhugh has made a careful study of this problem, having observed the advantages and disadvantages of storage for fruit and vegetables in all parts of the United States.

Professor Cole of Chicago University will be the speaker at our next meeting.

J. R. CLARKE, Cor. Sec'y.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you tell me where I can obtain seed of the following Gesneraceae: *Isoloma*, *gesnera* and *achimenes*?—R. P. B., Md.

Each of the three genera of the family Gesneraceae mentioned contain numerous species, which in the case of *achimenes*, especially, have become much confused by hybridization, and rarely come true to name. *Achimenes*'s seeds, mixed, are listed by Carters, Boston, but not the others. In all probability, that firm, or Suttons would be able sooner or later to supply *isoloma* and *gesnera* in certain species.—A. S.

I have in my garden a few white currant bushes. Can you inform me how I can multiply them, as I would like to have more plants of this same variety.—F. R., N. J.

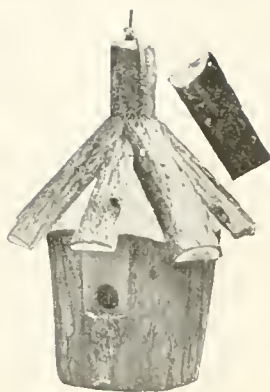
White currants are easily propagated by cuttings of last year's wood taken now. They may be inserted in sandy soil in the open ground or in a cold frame, keeping the sash on until rooted, and shaded from hot sun. Another method is to mound up the bushes with earth about a foot deep; the shoots will throw out roots into the new soil which can be removed from the parent bush the following Spring. Stronger plants are obtained by the latter method, as it enables a bush to be divided into well-rooted parts, but a larger quantity of young plants can be obtained in one season by taking cuttings.—A. S.

Here and There

RE-NAMING GERMAN IRISES

Editor GARDENERS' CHRONICLE

If the critic who claims an inaccurate statement in *American Botanist* will look a little closer at the text, he will note that the statement reads "the reason certain irises are called German irises is because they are derived from a species of Central Europe named *Iris Germanica*." This is exactly the truth. No claim is made that all bearded irises are German irises. You will note that *certain irises* only are mentioned. Nor is the claim made that any of these grow in Germany. The habitat of *Iris Germanica* is given as "Central and Southern Europe." Under the circumstances the claim that the quotation from *American Botanist* is inaccurate is wholly unfounded. The statement criticised is not even misleading. As to the hybrids between *Iris*



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Germanica and other forms or species—they are not true German irises. One may call them what he pleases. But when it comes to botanical species the rules of nomenclature govern, and sentiment, prejudice, and sectionalism have no bearing in the matter.

WILLARD N. CLUTE,
Editor *American Botanist*.

THE WISTARIA

Amongst the most beautiful sights that may be seen one may place that of a fine old and well-grown wistaria draping the face of a massive building, and when it is understood that the same plant which flowers so well in May or June (according to climate) will produce a second crop or aftermath in August or September, it will be conceded that few others of our wall plants give so good a return. This second flowering happens, more or less, every year with *W. sinensis* if the plant is slightly cutover as soon as the first flowers have faded. Undoubtedly a warm house front with south aspect is the best place for wistarias in this country, though in the milder portions they are also effective as coverings for pergolas and arbors, if it is borne in mind that once the plant begins to grow freely it should be given plenty of room and very little curtailment beyond removal of the unripe wood, and keeping the main branches fairly thin so that they can get the full effects of sunlight and air to ripen them. Personally, I think wistarias are best when trained horizontally on a wall with tiers of branches one above the other, and this is the method and position I should always choose.

The one difficulty is to get young plants to grow freely, as they are often stubborn in the matter of growth for a year or two after planting. To those, however, who know how to wait, it may be consoling to learn that even if growth is slow during the first year or two, the progress after they have become established is very rapid, and lost time is then soon made up; and there is also the satisfaction of knowing that no plant is more accommodating when once established, and that a good start once made gives a result that will last for many generations.

I know plants in this country with an approximate age of 150 years, plants with stems nearly one foot in diameter, and covering a whole house front year after year with beauty, and showing no signs of ill-health. In building up young plants all growth should go on unchecked so as to stimulate root-action. Sometime in the early Spring all unripe tips should be removed and growth again encouraged without curtailment. In future years the aim should be to choose the best shoots for training into position until the whole available space is covered. For a few years flowering racemes may not be over numerous, but when the wood gets large enough and firm enough flowering spurs will become more plentiful, until at last the whole space becomes covered with flowers in their season. The soil should be rich and well drained so that the ripening influence of sunshine, is assisted.—O. A. *Amateur Gardening* (English).

USE OF VARIEGATED TREES AND SHRUBS

In no class of ornamental planting is more judgment and discrimination required than in the use of variegated and colored trees and shrubs, as these plants can easily be overdone and a patchwork landscape be evolved that is never entirely satisfactory. The first thing to remember when planting

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Pro German Irises

In the face of all the discussion that has been going on in the horticultural press about dropping the word German and even germanica, in referring to the bearded Flag Iris, it is imprudent and indiscreet, to say the least, to flaunt this word before the public, as some nurserymen are doing, in their advertisements. I, for one, intend to use always the more beautiful and thereby to avoid all appearance and all suspicion of evil.

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is that Nature's color is green, and, in every class of plant, green of some shade or other is the predominating color. More than half the beauty of flowers or colored foliage would be lost if there were no green to act as a foil to what without it would be harsh and glaring. In looking at a garden gay with flowers in the Summer-time, it is pleasant after a while to rest the eye on a cool stretch of grass or the rustling leaves of trees. The colors of the flowers are not dimmed, but enhanced by the contrast. The eye, however, is rested by the change from the dazzle of reds, blues, pinks, etc., to the cool green of Nature.

A certain proportion of colored foliage, however, is necessary in the garden, especially during the Winter months, when the green of Nature is practically one uniformly deep tint, and a certain number of colored evergreens is necessary to brighten the landscape.—*Exchange.*

Practical Golden Rule

A few readers—and only a few, we hope—laughed at us when we used the above heading on this page recently. It struck them as a joke. The Golden Rule, they assured us, was not a practical, workable guide in the everyday affairs of life.

Yet we find that more and more the world is coming to see there is no hope for man except in his spiritual acceptance of religion as a reality. For instance, permit us to quote the following from the *Literary Digest*:

"Take your Troubles to the Lord—He's your Big Boss," was the counsel recently received and acted upon by a body of mill workers in Wheeling, West Virginia, who were on the verge of going out on strike, and in Cleveland, Ohio, a dispute between Swift & Company and 550 packing house employees was settled after the strikers and the management of the plant had listened to a homily on the love of God and the necessity of returning to his teachings by John J. Walsh, Conciliation Commissioner of the United States Department of Labor."

That advice, to "Take your troubles to the Lord He's your Big Boss," sounds a little flip-pant, perhaps. But isn't it a piece of sound advice? It proved to be so, to the labor assembly of Wheeling, which passed resolutions to this effect:

"First, Be it hereby resolved, that we, the duly elected delegates representing all of the organized crafts of the Wheeling district, do hereby unanimously declare it to be our belief that the teachings of Christ constitute a platform upon which all men can agree.

"Secondly, That we believe they can be applied to modern industrial problems."

"This is the first time that either capital or labor has gone on record as officially

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indorsing the teachings of Jesus Christ," says the Columbus *Labor News*. "On such a stand labor and capital would have no trouble to get together."

And the *Wheeling-News* declares that "the principle of doing unto others as you would be done by, is a pretty good one to follow, and its observance would tend to remove many difficulties, industrial and otherwise."

We hope it will not seem to any reader that labor unions, corporations, and even farm paper editors are out of place in preaching the gospel of the Golden Rule at this time.

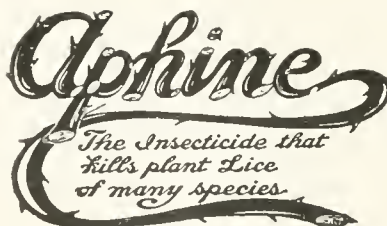
The Bolsheviki brethren are passionately

trying to tear down the religious beliefs of the world, and in the reaction against their frightful materialism the most modest layman may well take a stand for his faith.—*Farm Life.*

A man in the next flat was pounding on the wall. "Look here," he cried, "I can't sleep with your kid yelling like that! If you don't make him stop, I will!"

"Come in, sir, come in!" said the kid's father. "You'll be as welcome as the flowers in Spring."

—Edmund Burke, Scotsman.



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APHINE is a concentrated material—mixes readily in water—efficient in its action—easily applied—free of the disagreeable odors and features of most insecticides—excellent as a wash for decorative plants.

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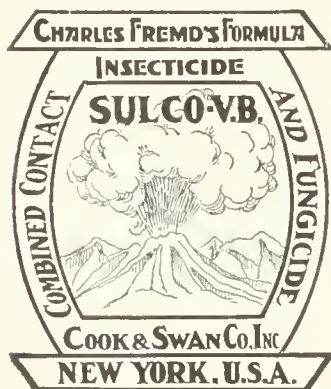
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No gardener need be afraid to recommend to his employer treatment of any valuable tree under the Davey method, but rather feel that he is looking after his employer's interest by the assurance that his trees will surely be preserved.

You have my hearty support in this important profession of preserving our trees.

Very truly yours,

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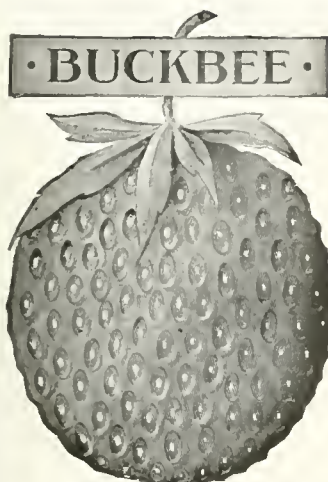
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(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

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No. 6

Things and Thoughts of the Garden

THE ONLOOKER

SPRING flowers are always awaited with eager interest in this northern climate and never were they more warmly welcomed than this year when everyone seemed to be "on edge" because of the tardy arrival of Spring after an especially disagreeable Winter. In Midwinter we are inclined to sigh for a warmer clime, but when at last Spring really arrives the tropics no longer appeal. As compared with last year the earliest plants noted were three weeks later in coming into flower, but there was this notable difference, that whereas last year the earliest flowers were ruined by frosts after opening, this year we enjoyed their beauty to the full, and for a longer time than usual owing to the cool weather which prevailed generally through the first part of May. At the time of writing though, the season is fast catching up and the landscape is most beautiful with the delicate tints of young foliage and opening Apple blossoms in great profusion. In this locality most flowering trees and shrubs are making or give promise of a very good showing, the Forsythias, Magnolias and the *Pyrus* family being especially noteworthy in this respect.

The fragrant flowers of the lovely *Magnolia stellata* were of perfect purity this year, and although some years we may be disappointed because its flowers are discolored by frosts, it is well worth planting in a favored spot which might be found even in many small gardens. Being more of the nature of a large shrub, rather than a tree, in habit, and of rather slow growth, it does not require nearly as much space for development as the larger and later flowering kinds need.

* * *

Any place which has a piece of woodland included in its area, or even a rough piece of boggy uncultivated ground, presents an opportunity for a style of gardening which many people would find very satisfying and restful. Fifty years ago Wm. Robinson, a noted English gardener and author, wrote his book "The Wild Garden," in which he earnestly set forth the possibilities and pleasures of the naturalization of both native and exotic hardy plants. Since then the wild garden has become quite a familiar feature in British gardening and seems to be fully as pleasing as the stereotyped bedding system so much in vogue when "The Wild Garden" was written. We have many estates and gardens where ideal conditions exist for this kind of work and it is always a pleasure to come across places where these conditions have been recognized and made use of to good purpose. There is a peculiar beauty and charm possessed by many of the native plants but which shows out to good advantage only

when grown under conditions approximating their native haunts. Treated as ordinary garden plants most would suffer in comparison with the more showy cultivated kinds, but see them growing in masses in shady, moist, uncultivated places and there is nothing to surpass them. What is there more pleasing in the opening days of Spring than a broad drift of Bloodroot or the little *Hepatica*, or what more lovely than a big colony of the giant white *Trillium*. Violets and Wood Anemones, Columbine and Virginian Blue Bells, Marsh Marigold and Forget-me-not come readily to mind as beautiful features in the Spring picture, while at the other end of the flowering season we recall masses of Asters, Golden Rod and Joe-Pye weed just as effective and beautiful in their natural setting as the finest well tended border plants of the garden. Then there are lovely Ferns suitable for almost any situation, some for open sunny places, others for shade, some which flourish in dry ground as well as those which like much moisture. There is really a much greater variety amongst the native Ferns than might at first thought be supposed, some forty kinds being listed by one New England nurseryman. A strong point in favor of developing this kind of flower gardening wherever conditions will allow is that all the subjects are quite hardy and the labor and expense involved is not great. There is every reason to suppose that we shall see increasing interest taken in this very satisfying phase of gardening.

* * *

Few flowers show to better advantage when naturalized than do the various forms of *Narcissus*. Along woodland walks, on banks, and in rough grassland the charms of these delightful Spring flowers are displayed to perfection; and we can think of nothing else that will give greater pleasure for so little expense and labor. Once established they will take care of themselves and make a fine showing for several years if the foliage is allowed to mature before any tidying up takes place. Of course all formality in planting must be strictly avoided, such as straight lines and even spacing, else the pleasing natural effect sought for will be entirely spoiled. Some gardeners make it a practice to plant out *Narcissus* after they have been forced in the greenhouse and such clumps will flower splendidly the following year. It is really a pity that any should be thrown away as long as there are any empty spaces where they could be planted, such as in the shrub borders for instance, where they would not be in the way of anything else, but would bring added life and beauty before the regular occupants got under

way. So far as varieties are concerned, any of the strong growing kinds seem to do equally well.

* * *

Under certain conditions the introduction of rockwork as an edging to long straight flower borders can be made a feature well worth while and several instances where this has been done with a decidedly good effect are recalled. Such an arrangement allows the free use of many of the low growing and spreading perennials to the best possible advantage, while the plants themselves can be better cared for. One need not be a rock-garden expert in order to make a good job of the arrangement of the stones, but they should be arranged as informally as possible and not used too freely. The nature, of the plants themselves and their proper disposition will still further strengthen the appearance of irregularity which it is most desirable to obtain. Of the numerous plants available the following are all good doers and easily obtainable. *Alyssum saxatile*, *Arabis alba*, *Saxifraga crassifolia*, *Phlox subulata*, *P. divaricata*, *Iberis sempervirens*, *Daphne cneorum*, *Armeria maritima*, *Gypsophila repens*, *Cerastium tomentosum*, *Aster alpinus*, *Dianthus deltoides*, *Campanula carpatica*, *Nepeta Mussinii*, *Tunica saxifraga*, *Saponaria ocymoides*, *Sedum*, several species, *Semprevivum arachnoideum*, and *Heuchera sanguinea*. Of several of the species mentioned there are garden varieties which show some point of improvement perhaps in form and color. Nearly all are more or less evergreen, so that they make a good appearance even when not in flower.

* * *

Any broad-leaved evergreen shrub which can pass through our northern winters unscathed is worthy of frequent mention, and still more of wider attention from those who plan and plant beds and borders designed to give the best effects for the longest time. The subject of this note, *Pieris floribunda*, sometimes called *Andromeda*, is already well and favorably known to many, and we have never heard anything but good concerning it. As an edging for a bed of *Rhododendrons* or a border of coniferous evergreens it is admirably adapted and is also very well suited to planting in the rock garden where it appears to excellent advantage amongst the boulders. The small white flowers abundantly produced in upright racemes open early in the Spring, one of the earliest attractions of the garden. As a matter of fact this shrub gives the impression of being in almost continuous bloom by reason of the flower buds being developed some months before opening. Another very good small evergreen shrub, of first-rate habit of growth, free flowering and easy to establish is *Leucothoe catesbaei*. This plant grows to perfection in a moist soil and shady situation, but will also stand sunlight and average soil conditions, although here the growth is not so luxuriant and the foliage takes on a deeper bronzy tone in the winter. The arching sprays of shining green leaves bearing lovely white flowers in dense racemes are exceedingly handsome. Both these plants are well worth growing in pots for Winter blooming in a cool greenhouse. Plunged outside in the Summer time they give good results for many years with the minimum amount of care.

* * *

It would be interesting to know what kind of plant holds the record for continuous blooming. As far as my experience goes I should award the honor to two of Trickers' hybrid Water-Lilies, *Nymphaea Mrs. Woodroffe Wilson* and *Panama-Pacific*. These two varieties are just completing their fourth year of continuous blooming and at the present time are going very much stronger

than the redoubtable *Johnny Walker*. The plants, which of course are growing in a greenhouse tank, have been kept in healthy condition by partly renewing the soil annually, using a mixture of equal parts good turfy loam and well decayed cow-manure. They have stood pretty drastic cutting of the roots in this process, which was always done about Midsummer, without suffering any check in growth, but a good many of the older leaves were cut off at the time. An interesting feature in both varieties is that young plants are produced at the leaf base. It may be a new idea to some to learn that Water Lilies may be grown and flowered in an eight inch pot on the greenhouse bench. Neat little miniatures can be easily produced in this way by simply stopping the hole in the bottom of the pot with cement, using rich compost and leaving an inch or so of space at the top to keep filled with water.

* * *

In these days, when attention is directed to the merits of many of the things of our grandmothers' time, we might well consider the claims of the good old fashioned Sweet William for a wider use in our modern gardens. This we find is one of the oldest of garden flowers, having been introduced into English gardens from Eastern Europe nearly three hundred and fifty years ago. A bed of Sweet Williams in full bloom is one of the delightful features of the flower garden in early Summer, and for its fragrance alone it is well worth a place. Modern strains are extremely showy with individual flowers of large size as compared with the older varieties. Like all members of the *Dianthus* family it prefers a well drained soil and best results are likely as a rule if the plants are treated strictly as biennials. Right now is a good time to sow seeds to give strong flowering plants next year.

* * *

Steep banks in the garden are more or less of a nuisance to keep looking in good condition when covered with grass and oftentimes a more pleasing appearance would result from the use of suitable vines planted thickly enough to entirely cover the surface. For a sunny slope the Memorial Rose *Rosa Wichuraiana*, or some of its hybrids are very well adapted, but before planting these be sure the soil is free from witch-grass or it will be sure to dominate, and while excellent in itself as a soil-binder is a good deal of a pest when mixing with garden plants, Roses especially. *Clematis paniculata* makes a good showing in such a position as also does Hall's Japanese Honeysuckle. The Virginian Creeper, *Ampelopsis quinquefolia* will grow anywhere, even on an ash heap. Some people confuse this most useful plant with poison ivy but the number of leaflets afford a simple distinction, in the latter there are three only while the Virginian Creeper has five. Where an evergreen ground cover would be more desirable there is nothing better than *Pachysandra terminalis*, which forms a dense carpet and is absolutely hardy, never showing the least trace of Winter injury as far as I have observed.

We regret to have to announce that with this month's issue we lose one of our interesting contributors, "The Onlooker," whose identity has aroused much curiosity and speculation. As he now retires from this department to take up added duties which have come to him as gardener and instructor at Smith College Botanic Gardens, we want to assure our readers that "The Onlooker," H. Ernest Downer, will from time to time contribute special articles to our columns. Things and Thoughts of the Garden will be continued by "The Observer."

The Fibrous Rooted Anemones

HENRY J. MOORE

Oh! the joy of a springtime morn
When the sun smiles from the skies,
And the wild birds sing, and the flowers spring
Before my wondering eyes.
As I walk along to a happy song,
My troubles to beguile
On that vernal way all through the day
In the sunlit greenwood aisle.

WHAT child in the Spring months of the year has wandered through our beautiful woodland glades and has not been thrilled with the beauty of the flowers. Who old in years drinking again at the fountain in the glade of youth has not felt the hot tears of joy spring to his eyes?

There is nothing on God's fair earth harder to forget than flowers, except kind hearted human beings, and nothing which will more quickly bring a smile to the wrinkled old face or a tear of joy to the eye than the flowers, for they are an inheritance undefiled, and which cannot pass away, so it is that the spirit of youth and of age and the emotions of the heart are much alike in the flower clad glade where no heart is ever old.

When in the final analysis of things the life secrets are laid bare, better to have the imprint of a flower on the heart than all the dollars of Christendom, for therein the Great Analyst may see the reflection of his own wisdom, so from the Anemone (*hepatica*) the Common Windflower of our glens, the writer got his inspiration to write this article.

There are no worthier subjects of the garden than the fibrous rooted Anemones, their uses are so varied. Many are suited for woodland planting, for the herbaceous border, and many, perhaps the majority, are well adapted to the rockery. Some of the Windflowers are not hardy without protection, although generally they will withstand a very low temperature. In conjunction with the tuberous forms, which will not be mentioned herein, a display of flowers is possible from opening Spring until frost injures vegetation. The various species or varieties differ greatly in foliage, flowers, and in height. In the latter respect they vary from three inches to three feet or more.

Anemone alba, which flowers in June, is suited to the rockery, it is six inches high. *A. alperia* flowers in May, the flowers being variously colored, six inches high, and adapted to the rock garden. *A. angulosa* has flowers of sky blue, which are two inches in diameter. It grows about twelve inches high and flowers as soon as the snow leaves the ground. It is good for either the rock garden or the herbaceous border. *A. cernua* has flowers which are drooping and of a purple color. Its height is about six inches. It is well adapted to the rock garden, and flowers in May. *A. decapetala*, the ten-petaled Anemone, has creamy, white flowers, which are quite erect and nearly two inches across. It usually flowers in June and is splendid for woodland planting. It is about twelve inches in height. *A. dichotoma*, which is sometimes known as *A. pennsylvanica*, is a native of North America and Siberia, hardy, and splendid for naturalizing in the wild garden or woodland or for rock garden planting. The flowers are white, slightly shaded, with red on the under side, height about eighteen inches. *A. fulgens*, the flowers are vermilion with black stamens. A

very showy plant, splendid for the herbaceous border, rock garden or among shrubbery. It requires a somewhat moist position. It is a good plant for growing in the greenhouse, or in the cold frame, as a pot plant, and may later be flowered in the living room window. It does not require much heat. The plant which is regarded as a variety of *A. hortensis*, flowers in May or early June. *A. Halleri*, with purple flowers, which open in April, growing usually to a height of about six inches, for the rock garden or front of the herbaceous border.

Perhaps to inhabitants of North America no Anemone is better known than *A. hepatica*, the common Hepatica, with its blue flowers. It has many varieties with white, reddish, sky blue and other colored flowers. They flower in shady glens and woodlands, and prefer a light, humic soil, preferably one in which leaf soil predominates. Being quite hardy, the plants require no protection after the first year. They are good for naturalizing in the wild garden, woodland, or to plant in the rock garden, or in shady parts of the herbaceous border, where they are allowed to spread naturally and remain undisturbed. The best time to plant the *Anemone hepatica* and its varieties is just after they flower in Spring, or in early Fall. If potted and brought slowly into flower, the *A. hepatica* varieties make excellent pot plants for Winter flowering in the window.

The Japanese Fall blooming Anemones, *A. Japonica* and its varieties, are among the best known garden forms. They are quite hardy and grow at least two and a half feet high. Under good cultivation, plants have been known more than three and a half feet. The flowers are at least two and a half inches across. The species has flowers of rosy carmine. *A. J. alba* is a beautiful, white flowered variety, which flowers from early September until mid-November, and apart from being a valuable border subject, its flowers are of greater value when cut, as they possess long stems and last long in water. There are other varieties with rose colored and other flowers, notably *A. J. elegans*, which has several synonyms. All the varieties of *Anemone Japonica* should be grown. They require a well worked, light and deep soil, full of organic matter, and do best when planted during Spring. In the very cold localities some protection must be given.

HACKING AT THE ROOTS

CIVILIZATION, as we have thus far known it, rests upon certain fundamental institutions and ideas. The family, the nation, the institution of property, the idea of individual liberty and individual responsibility, the idea of liberal culture—these are some of the bases upon which everything that we regard as worthy and precious has been built up. There is not one of them that is without grave shortcomings; not one in which there is not room for improvement; not one upon which our views have not undergone notable change in generation after generation. But in their essentials, and in the place they hold in the life of the world, they have thus far remained unshaken. They are exposed today to more formidable and more many-sided attack than at any previous time in modern history.—*The Review*.

Making Pictures of Landscapes

THE trouble with the appearance of many home grounds is not so much that there is too little planting of trees and shrubs, but that this planting is meaningless. Every yard should be a picture. That is, the area should be set off from every other area and it should have such a character that the observer catches its entire effect and purpose without stopping to analyze its parts.

Bushes and trees scattered promiscuously over the area, has no purpose, no central idea. Its only merit is in the fact that trees and shrubs have been planted, and this, to most minds, comprises the essence and sum of the ornamentation of grounds. Every tree and bush is an individual, alone, unattended. Such a yard is only a nursery.

The better plan is a picture. The central idea is the residence with a warm and open greensward in front of it. The trees and bushes are massed into a framework to give effectiveness to the picture of home and comfort. This style of planting makes a landscape, even though the area be no larger than a parlor. The other style is simply a collection of curious plants. The one has an instant and abiding pictorial effect which is restful and satisfying, the other simply arouses the curiosity, obscures the residence and divides and distracts the attention.

If one catches the full meaning of these contrasts, he has acquired the first and most important conception in landscape gardening. The conception will grow upon him day by day, and if he is of an observing turn of mind he will find that this simple lesson will revolutionize his habit of thought respecting the planting of grounds and the beauty of landscapes. He will see that a bush or flower bed which is no part of any general purpose or design—that is, which does not contribute to the making of a picture—might better never have been planted. A bare and open pasture were better even though it contained the choicest plants of every land.

Reduced to a single expression, all this means that the greatest artistic value in shrubbery lies in the effect of the masses, and not in the individual shrub. A mass has the greater value because it presents a much greater range and variety of forms, colors, shades and textures, because it has sufficient extent or dimensions to add structural character to a place and because its features are so continuous and so well blended that the mind is not distracted by incidental and irrelevant ideas.

If a landscape is a picture it must have a canvas. This canvas is the greensward. Upon this the artist paints with tree and bush and flower the same as the painter does upon his canvas with brush and pigments. The opportunity for artistic composition and structure is nowhere so great as in the landscape garden, because no other art has such a limitless field for the expression of its emotions. There can be no rules for landscape gardening any more than there can be for painting or sculpture. The operator may be taught how to hold the brush or strike the chisel or plant the tree, but he remains an operator; the art is intellectual and emotional and will not confine itself in precepts.

The making of a good and capacious lawn, then, is the very first practical consideration in a landscape garden for a country home. This, provided, one conceives what is the dominant and central feature in the place, and then throws the entire premises into subordination with this feature. In home grounds this

central feature is the house. To scatter trees and bushes over the area defeats the fundamental purpose of the place—the purpose to make every part of the grounds lead up to the home and to accentuate its homelikeness. Keep the center of the place open. Plant the borders. Avoid all disconnected, cheap, patchy and curious effects. It is not enough that the bushes be planted in masses. They should be kept in masses by letting them grow freely in a natural manner. The pruning-knife is the most inveterate enemy of shrubbery.

The use of flowers and bright foliage and striking forms of vegetation is not discouraged, but these things are never primary considerations in a good place. The structural elements of the place are designed first. The flanking and bordering masses are made the same way that a house is painted after it is built. Flowers appear to best advantage when seen against a background of foliage, and they are then also an integral part of the picture. The flower garden, as such, should be at the rear or side of a place, the same as all other strictly personal appurtenances are; but flowers and bright leaves may be freely scattered along the borders and near the foliage masses.

What kind of shrubs and flowers shall be planted is a wholly secondary and largely personal consideration. Be sure that the main plantings are made up of hardy and vigorous species and have lots of them. Then get the things liked best. There is endless merit in the choice of species, but the point to emphasize is that the arrangement or disposition of the plants is far more important than the kinds.

It should be said that the appreciation of foliage effects in the landscape is a higher type of feeling than the desire for mere color. Flowers are transitory, but foliage and plant forms are abiding. The common roses have very little value for landscape planting, because the foliage and habit of the rose bush are not attractive, and the blossoms are fleeting. Some of the wild roses and the Japanese *Rosa rugosa*, however, have distinct merit for mass effects.

Very soon one finds himself deeply interested in these random and detached pictures. He soon comes to feel that flowers are most expressive of the best emotions when they are daintily dropped in here and there against a background of foliage. Presently he rebels at the bold, harsh and impudent designs of some gardeners, and grows into pure and subdued love of plant forms and verdure. He may still like the weeping and cut-leaved and parti-colored trees of the horticulturist, but he sees that their best effects are to be had when they are planted sparingly, as flowers are, as borders or promontories of the structural masses.

It all amounts to this, that the best planting, like the best painting and the best music, is possible only with the best and tenderest feeling and the closest living with Nature. One's place grows to be a reflection of himself, changing as he changes, and expressing his life and sympathies to the last.—*The Countryman*.

Give a man the necessities of life, and he wants the conveniences; and he craves for the luxuries, and sighs for the elegances. Let him have the elegances, and he yearns for the follies. Give him all, and he complains that he has been cheated both in price and quality of the articles.

Foothill Flowers in the Rockies

S. R. De BOER

THE foothill slope of the Rockies, the mesa meadow where colors run riot, is it too gross an injustice to her to select a half dozen of her children and not mention the dozens, nay hundreds of the others? Where the rattler hisses, where Peter Rabbit houses under a rock instead of under a time honored briar bush, there is the gay colored portal to the white and lofty peaks.



Gilia (Gilia agragata)



Mariposa Lily (Calochortus Nuttallii)

A stately little queen in the grasses of the July meadow, a queen among the thousands of other little beauties, is the Mariposa Lily. With its three petals of white, shaded into a yellow green at their base, it barely looks out over the heads of the other meadow plants. But not a wet and low ground meadow this; can we call it a mesa meadow?



Blanket Flower (Gaillardia)

The bright burning scarlet of the *Gilia*. Has it any other name but *Gilia agragata*? A long tubed corolla, sometimes the purest white, or the most delicate pink, the brightest scarlet. Biennial is the root of this plant, which is easily grown, multiplies itself by seed into patches of gorgeous colors. The tops grow as high as three feet under cultivation, but the dry locations where growth is less luxuriant and colors more intense are preferred by it.

But it is not for the defense of the bright yellow, crimson eyed, blanket flower, *Gaillardia*, that the hill is armed. Everybody for himself, God for all of us, is the slogan in the flower world. How bright she is, with smiling moon face, this Blanket flower. Why blanket? Yes, grower of things, lover of the tamed beauty, it will grow in your garden. It will smile at you, tho' its color may not be bright, its smile not as broad as out there on the dry hill slope.

The mountain side is still snow patched as the Pasqueflower pushes its hairy bud through the bed of pine needles.

The Pasqueflower used to be an *Anemone* but of late has taken out citizen papers as *Pulsatilla*. Planted in the garden on rather dry locations in well drained soil it is a grateful, smiling little flower.



Pasqueflower (Pulsatilla hirsutissima)

As the bell tower on a fortified castle, stands the flower spike of the *Yucca*. Shall we call it soapweed? Good, soapweed then. Did you ever see the root of this bayonet-like plant? That is right, we can call it Spanish bayonet, but soapweed is our home name, why not? But the root; a great big tuber, in which moisture and plant food is stored for severe times. A *Yucca* covered hill with their green colored leaves in Winter, looks like a well defended camping ground, with the rifles stacked, but loaded, the bayonets ready for action.



Spanish Bayonet or Soapweed (Yucca)

Do not look on your work as a dull duty. If you choose you can make it interesting. Throw your heart into it, master its meaning, trace out the causes and previous history, consider it in all its bearings, think how many even the humblest labor may benefit, and there is scarcely one of our duties which we may not look to with enthusiasm. You will get to love your work, and if you do it with delight you will do it with ease. Even if at first you find this impossible, if for a time it seems mere drudgery, this may be just what you require; it may be good like mountain air to brace up your character.—Lord Aitchbury.

Clover Honey

H. W. SANDERS

THERE is no flower that gives a better honey than white or alsike clover, and the growth of the clover plants by the roadside in the Spring and early Summer watched anxiously by the beekeeper in the Northern States, for the yield from this plant is generally the larger part of his income. The honey is nearly white, of good body, and a delicious aroma, which always makes a keen demand and a good sale for it. For comb-honey it is the whitest and always commands the highest price.

June is the month that sees the clover coming into bloom. The bees that have wintered well, and that have been prospered by favorable weather since they were taken from their Winter quarters, will now be crowding the hives with colonies that number thousands and tens of thousands, and the beekeeper will have to be very careful in his management to prevent premature swarming. A swarm just as the honey from clover is being gathered will be liable to cut the harvest in two, for 40,000 bees in two hives will not store one quarter of the honey that they would if kept in the one colony. Some increase will of course be required, either to recover Winter losses, or else for expanding one's stock of bees, but it is far better to make this artificially, than to permit the bees to swarm and spoil the clover crop. Should a swarm emerge, despite the care taken to avoid it, it should be hived and the hive placed on the stand occupied by the colony from which it emerged, the latter colony being moved to a new place. The effect of this operation is to cause all the older bees of the original colony to join the swarm, for they will have marked the spot where their home stood and will return there the first time they fly to the field. The colony will be so strongly re-inforced by these field bees that it will produce a larger crop than the "parent colony" would have done. The parent colony, being thus removed, will in due time hatch out a young queen, and will be in excellent condition for wintering.

How to prevent swarming? That is a question that has given rise to more debate than anything else in all the art and science of bee-culture. Of course, the mere prevention of swarming is easy enough: the caging or removal of the queen, will effectually prevent swarming for the swarm will never emerge without her, but how to prevent swarming and at the same time produce a good crop of honey, and have a good bee-yard for Winter, is by no means so simple a business. Where very large hives are used and extracted honey is produced, swarming is much less of a problem, but with the standard hives, and particularly with the production of comb-honey, a good deal of care and attention is needed.

It is essential to open the hives once a week, or at least once in nine days, and to examine the combs for the queen-cells that are always the signs that a colony is getting ready to swarm. For the busy man who keeps a few hives as a side-line, it is better to have a certain day of the week set apart for this duty, for then it will not be forgotten. If the weather should be unfavorable on that day however, the first opportunity thereafter should be taken. A queen cell is sealed over when the embryo queen is nine days old, from the time the egg was laid, and usually a hive that is going to swarm may be depended upon to do so on the first fine day after the first queen cell is sealed over. So that if it is visited at intervals of a week there should be no possibility of a swarm coming out accidentally.

One of the first things a beginner with bees thinks

he has found out for certain is that by cutting out queen-cells he will prevent swarming. Occasionally it will, and after the first lot of cells have been removed, or squashed on the comb, there will be no more built, but more often it will be found that the bees will immediately start new ones, and will go ahead and swarm on one fine day without waiting for these to be completed. So that it is not wise to try to prevent swarming by this means alone. Our own practice is to examine all colonies once a week, to cut out the first cells that are constructed and to mark such hives and visit them again in three days. If they have resumed the business, then there is nothing else for it but to break up the colony to some extent.

The usual method is to take the combs out of the hive one by one, and shake all the bees off in front of the hive and then to place empty combs within it. Thus the brood is all taken away—sometimes one comb of brood is left so as to prevent the bees deserting the hive, but often the entire brood is removed and the bees have to start just as if they were a swarm newly hived. The brood is taken and placed in a second hive-body above a weak colony. The bees that emerge will then bring this weak one up to full strength in a few weeks. The temperature at night must be considered in connection with this operation. If it is cold and the brood is all given to a weak colony, some of it will perish by cold, and in that case it is distributed between several of the weaker colonies. If the weather is warm and the season prosperous, the brood may all be given to one colony.

If there are no weak colonies to be strengthened, the "Alexander plan" is the best. A queen excluder is placed over the colony, and the brood is placed in a hive body above it, one or two combs and the queen being placed below, with empties, or foundation filling up the rest of the hive. By this means all the bees will emerge in this colony and strengthen it, and the maximum of honey will be secured, but the plan is not suitable for comb honey, for the honey gathered is largely placed in brood combs and must be extracted.

Of course, with either of the above plans, the incipient queen-cells must be destroyed at the time the brood is transferred, and with the Alexander plan, they must be destroyed again a week later.

IN PRUNING SHRUBBERY

1. Study the habits of each species and act accordingly.
2. Shearing shrubbery is poor practice always, except in hedges, and is likely to lose the blossoms.
3. A light cleaning with a pair of hand shears immediately after the flowering season will usually serve a good turn.
4. Instead of being headed back at the top, most shrubs should be thinned out at the bottom.
5. Instead of cutting out the suckers at the base, the old wood should be removed and young wood left.
6. This heavy pruning is usually given in March, but if well done every year can just as well be given in Midsummer.—F. A. W.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

DURING this month the big item is to maintain the pace already set, and make the most of the growing crops, by frequent and persistent cultivation.

No matter how good the soil it will not produce good crops, without proper cultivation. It not only helps the crops along by keeping down the weeds, but actually saves a vast amount of labor in watering, by conserving the moisture in the ground. Of all gardening operations cultivation is one that cannot well be overdone. Do it during wet weather as well as during fine, as by doing so any signs of trouble from too much water will be materially relieved. The loose surface soil becomes aerated and dries out more readily, thereby checking any tendency to stem rot, which oftentimes proves such a menace during extended wet periods.

Certain of our garden crops grow rapidly at this time of the year, and soon deplete the surrounding soil of all available plant food, which if not furnished results in stunted growth. Here liquid plant food is valuable, inasmuch as it is already in a form quickly available to the plants, is easy to apply, quick in showing results, and allows more latitude to the user than any other form of fertilizing. There are several forms of concentrated plant food on the market, accompanied by explicit direction how to apply, that are well worthy of the attention of those whose crops show signs of soil exhaustion. Onions, parsnips, salsify and similar crops may be fed lightly during the month, and more abundantly later in the season.

Peas will be plentiful this month though coming in somewhat later than usual. Pick the pods every day when the vines are bearing, and don't let them get hard and yellow before using them up. If certain of the varieties you have selected seem hard and dry it is because they have been left on the vine too long. Keep the pole beans tied up as they begin to run and save yourself considerable trouble later on. Use the spinach when it is young, and should drouth overtake it turn on the hose freely. The potatoes should be well cultivated, and sprayed, in fact more so than ever before, since from present indications they are likely to be scarcer, and more costly than ever before.

As the succession crops of vegetables come on keep them properly thinned out. Don't neglect this important phase of work until the damage done is irreparable. All plants that require staking should be attended to as they require it. Tomatoes should be kept tied up, and eggplants and peppers may need some support especially in exposed situations. As soon as one can do without it cutting of the asparagus should stop. Don't make the mistake of cutting it until August, and expect good shoots next year. The plants should have an opportunity of rebuilding themselves, and just as soon as the cropping for the season is over is the time to apply a good dressing of well rotted manure supplemented with a complete commercial fertilizer, then one may reasonably expect a full supply of shoots another season. The asparagus beetle must be looked out for, and greeted with a good dose of poison when he puts in an appearance.

The muskmelons must be kept well sprayed: there is

no sure cure for blight, but spraying frequently with Bordeaux will in most instances prevent it.

Birds are being considered as friends of the gardener today, but like the gardeners' boy they have an habit of violating the neutrality of the strawberry patch, and some protection is necessary. A net is best. A series of strings run along the rows with white cloth strips attached, will also help, and we have seen a cat in a wire cage do some useful work. Bush beans, beets, carrots, brussels sprouts, cauliflower, chard, cucumbers, endive, radishes, lettuce, spinach, muskmelons, watermelons, etc., may be sown now for successions.

Lettuce should be sown frequently and in small patches at this time of the year and wherever possible provision should be made for a semi-shaded position when setting out the young plants, as the strong sun in Summer causes the heads to run to seed quickly. English Frame Cucumbers can be grown in the open or better still in a cold frame or spent hotbed if one is available. Lay down a few pieces of pea brush for the vines to climb over so that they will be off the ground. Several plantings of corn should be made during the month. On small areas rows are preferable to hills, inasmuch as they are more easily handled. The rows should be three to four feet apart, according to the variety and the plants thinned out to from eight to twelve inches apart.

Keep the sweet peas picked clean when they commence flowering. Don't allow any pods or seed to develop or the vines will stop producing. Nor should they be allowed to suffer for want of water. Once the vines begin to turn yellow there is no hope for them. Complete the setting out of bedding plants as soon as possible, keeping any surplus in reserve for filling blanks that may occur. Stakes should be on hand and all flowers tied up as they require it.

As soon as *Achillea* is through flowering cut it down to the ground so as to get another crop of blooms later on. Keeping all dead flowers picked off not only helps the plants but adds materially to the general appearance of the garden. *Corcopsis* cut close will make a show of color all the season.

Labeling and marking of plants to be moved later should be done whilst they are flowering.

Sowings of annuals may still be made, for it is not yet too late to start a flower garden. There is a vast number of seeds which, if sown at this time, will produce freely of flowers between now and the first frosts.

Asters, Annual Gaillardias, Clarkias, Larkspurs, Lupines, Poppy, Amaranthus, Arctis, Zinnias, Candytuft, Alyssum, Annual Gypsophylla, Cornflowers, Marigolds, and many others afford one a wide choice.

The roses need attending, too. A little liquid manure applied occasionally will help them a lot. Don't however, over-do it or a weak soft growth may result, which is not conducive to free flowering. Keep the rose bugs picked off the plants. We have now a commercial commodity which, it is claimed, will kill these pests by spraying it on, but we prefer to extend our acquaintance with it further before we can vouch for its efficiency in this respect.

Spraying of the fruit trees should be continued as

occasion demands and opportunity offers. Thin the fruit on trees that are carrying too large a crop, in fact it is good practice on all trees where really fancy fruit is wanted. Keep an eye open for the borers, and cut them out at once. Peach trees affected with yellows should be cut out, and burnt as soon as found, since this is a disease that spreads rapidly. A mulch should be applied to all small fruits as they are shallow rooters, and soon show the effects of drouth. Relieve the annual Spring rush by cutting out the old woody shoots of the currants and gooseberries, immediately picking the fruit. Grapes should be tied up, and if troubled with insects, and you want high quality fruit cover the bunches with bags.

About the grounds the elms will need to be sprayed with arsenate as early in the month as possible, as it is of little use doing it after the larvæ begin to come down. Large trees newly planted should not be allowed to suffer for want of water, and take time to apply a good mulch after watering. The new shoots on the climbing roses should be tied up, and after the flowering period is past remove one or two of the older stems and tie the young ones in their place, in this way there will always be a supply of young wood for flowering. Seed pods should be removed from evergreen flowering plants, such as Rhododendrons, Andromedas, Kalmias, etc., as they are an unnecessary tax on the plants.

Immediately they are through flowering is the time to prune the early blooming shrubs. Don't make the mistake so often seen of cutting the tops off at any regulation height, but get down into the plant and remove some of the oldest wood, so that new wood will be produced for flowering another year.

In the greenhouses we are at a period of the year when preparations are being made for next Winter's supply of cut flowers. The old plants thrown out, soil renewed, and a general clean-up given prior to a fresh start. In proceeding with the general clean-up, it may be well borne in mind, that such plants, as *Adiantum*, *croceanum*, *cuneatum*, *gracillimum*, the *pteris*, *cyrtomium*, *polypodium*, *darallia*, *nephrolepis*, etc., not to mention *cyclamen*, primulas, and other flowering plants, will do as well or better in frames, than in the greenhouses. They will not only thrive, but they are out of the way, and will not have to be carried from place to place during the cleaning operations, and moreover less liable to get damaged.

Where antirrhinums are to be grown for an early Winter crop, the seedlings should now be ready to prick off, so that they may make all the growth possible before planting to the benches early in August. While the tall varieties give the best spikes, yet where a variety of flowers have to be grown in one house, as is often the case where greenhouse space is limited, the intermediate varieties can well be planted on the side benches in the chrysanthemum house to which they make fine companion plants, as to temperature and general growing conditions. Strong plants, free from fungoid disease, will commence to bloom in October, and if given proper treatment will keep on flowering until Spring.

Among our warm house flowering plants the Amazon lilies are not as much in evidence as their beauty and flowering properties merit. Their culture is not at all difficult, and they may be grown either in solid beds, benches or pots. For a compost they demand a rather coarse fibrous loam, dried cow manure, broken brick, charcoal and coarse sand. Ample drainage should be provided, as copious supplies of water are needed during the growing season.

Shading from full sunshine is required during all save the Winter months, and a temperature of 65-70 suits them best. Those wishing to cultivate a few of these plants will find the present time a good one to begin. Established plants started in Midwinter, and now coming out of $\frac{3}{4}$ -inch pots are to be preferred. Pot culture is best where only a few plants are wanted, as they may be rested easily, and two crops of flowers readily obtained if the plants are treated rationally. By drying off the plants for a few weeks a crop of flowers may be had at almost any season, but they should never be dried to such a degree that all the foliage is lost or the bulbs will suffer. About the only insects that trouble these lilies are mealy bug and thrips, which may be controlled by timely use of the hose.

There is still time to put in another batch of Chrysanthemum cuttings; they will be nice plants for six-inch pots, and a very good quality of bloom may be had by growing them to single stems. The early started cuttings should be potted on as they require it, for the sooner they are in their flowering pots now the better. A good rich compost is essential, but don't let anyone tell you that it isn't possible to over feed these plants, for we have seen a whole house of them ruined by too much fertilizer. Feed them as they need it, but let little and often be the plan.

Crotons plunged in the benches in the stove house will now be growing rapidly. Some pinching will be necessary to keep them in shape. Simply pinch out the growth it is desired to stop, but don't do any cutting; it is not necessary.

THE DUTY OF AMERICANS

"In these days when countless thousands, unacquainted with our language, disregarding of our institutions, and thoughtful only of our opportunities, have been permitted to come to these shores, one lesson of the Pilgrim fathers is worthy of being stamped upon the heart of every liberty-loving American, and of becoming a vital principle in the life of each of us.

"The Pilgrims came to Plymouth to worship God and to make homes, determined never to return to Europe. They were willing to prosper if it were God's decree, but above all they came, as Bradford put it, 'to live a distinct body by themselves,' or as Robinson put it, 'to become a body politic.'

"In these troublous times, when freedom of speech is being used for the purpose of forcibly undermining the Government of the United States, it is well to remember that the Government of the fathers is unfit to survive if it is powerless to prevent unlawful assaults upon its authority.

"Whatever you may think about it, I hold that the first duty of an American is to worship God—not my conception of what God is, nor your conception—but God in the large and generic sense of a great first cause, a mighty ruler of the uncharted universe. Beyond that each of us has the right to clothe divinity in such garments as suit our own judgments and consciences.

"The second duty of an American is to make a home—and that's an all important thing. Dispense with as many things as you will in modern life, you have lost naught if you have retained a spot that you leave with regret at break of day and toward which the eyes of your heart turn at every waking and absent moment.

"So those who come here not intending to make permanent homes but expecting to return should not be received. This land should be loved no longer for its opportunities alone; it should be loved for its institutions as well. Newcomers should be made to learn our language, that they may understand our institutions. If atheists, homeless wanderers and fortune seekers had been kept without our doors one of the great lessons of the Puritans would have been learned and American institutions would now be backed up by citizenship more cohesive than ours."

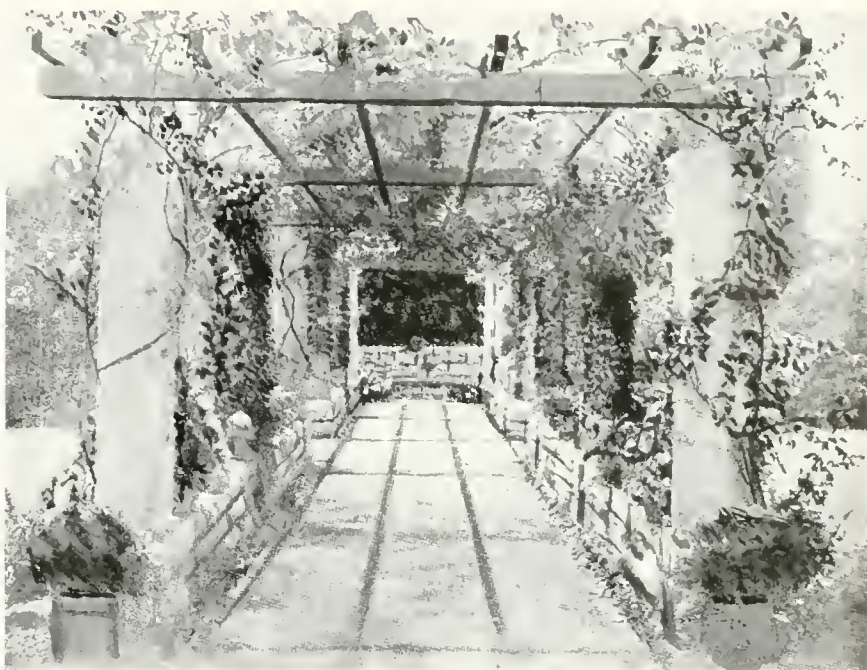
—THOS. R. MARSHALL, Vice-President of the United States.

A PERFECT PERGOLA.

The illustration has been reproduced from a photograph taken in the garden at North Lodge, Parktown, Johannesburg, and affords a good example of what a pergola ought to be. The proportions and manner of building are all that could be desired and the amount of "clothing" provided hits the happy mean so rarely secured for this kind of garden structure. Usually in this country one sees pergolas either looking bare or heavily over-weighted with creepers and other things. Here a variety of creepers has been chosen and the draped pillars look like the work of an artist. This is where the beautiful form of leaf mosaic makes to us its sure appeal, all sorts of fairy fingers beckon when the soft winds blow, and over-head, roses of pale pink and yellow nod their heads and occasionally throw us bewitching glances from below the beams. The top beams running the entire length aid the perspective; while the little square base from which each pillar rises, adds greatly to the effect, bridging the gap between stone work and pillar.

At the bottom of the stone work where it meets the grass on the inner side, lines of primroses bring joy to the heart each year, and seem to like their association with the stones. In some places on the tops of the walls the owner has had pockets made by the omission of stones. In these, suitable plants are grown and a less harsh and gentle outline is thus obtained when looking across from either side.

The rounded wall at the end, above the seat, is just the right height and forms a most agreeable termination to the green alley leading up to it. Here light and shadow in the long days of



Summer form a picture in themselves and one that is ever-changing all the year through.—*South African Gardening and Country Life*.

JAPANESE IRISES—(I. KAEMPFER).

WHILE the genus *Iris* is rich in beauty and variety, and affords material for either the amateur, professional, or enthusiast-specialist gardener to revel in for nearly six months of the year, the section above named stands not only pre-eminent of its race, but equally so among moisture-loving flowering plants at any season of the year. In a word, the Japanese Iris is unique, whether viewed from the standpoint of the splendor of the floral display and the living pictures the flowers create in garden scenery, or because of hardiness, or because of the several ways which they may be employed with good results in gardens regardless of their size. This much is said advisedly, since it was thought in the past—the idea is less prevalent today—that these plants could only be successfully grown at or near the water's edge. The idea was wrong, and led numbers into planting them in such places regardless of soil. In not a few instances clay of a most uncongenial type surrounds natural water basins, and this the Japanese Iris detests. Equally bad, or worse—it was in many instances attended by fatal results—among the early misconceptions of the plant's requirements was constant partial submersion in water, the heavy toll paid for so doing quickly telling the intelligent cultivator it was wrong. Twenty-five or more years ago, when many were urging the water-side as the only possible way of growing these Irises, I had them in considerable luxuriance in richly manured field soil, which in Summer time became dust dry many inches deep, a near neighbor growing them equally well in old potting soil in a worked-out gravel pit; hence it will be seen that the amateur with a solitary bed may score a success equally with the millionaire who appears to possess conditions more approaching the ideal. Professional cultivators, too, for some years past have realized the truth of the above statement, while the fact that the plants lend themselves so well to various positions in the garden should make of the latter—large or small—a more beautiful place than was possible before the whole

truth concerning the likes and dislikes of these Irises was revealed.

True, they are moisture-loving in the highest degree. True, too, that they associate admirably with water areas and are specially adapted for water-side gardening. For this they are ideal. At the same time it should be remembered that water is not their all-in-all. Equally important is a rich vegetable soil in which the roots can ramify freely; close, tenacious soils they abhor. Then of almost paramount importance, if perennial success is to be ensured, is raising the soil of the waterside planting area a foot or more above water-level, at which height the roots will descend and get all the moisture the plant requires. It is a far safer plan than the risky one of submerging, or even of having the roots continually in wet ground. These, then, are the things that matter in their cultivation; at once those to adopt and those to avoid.

The amateur to whom only a solitary bed is perhaps possible should arrange the surface of the bed slightly below the surrounding level, so that during growth and approaching the flowering period an occasional soaking of water may be applied with advantage. An item worthy of committing to memory, too, is that these plants have a voracious appetite, the established clumps forming huge mats of fibrous roots; hence a rich soil is much to their liking. In the case of light soils I prefer to employ a heavy dressing of cow manure, the cooling effects of which rather than its manurial value I find excellent for the plants. Incorporating some that is well decayed with the soil, a further layer a foot deep is good as a retainer of moisture and in other ways.

These Japanese Irises provide a rare feast of color beauty in the garden—white, blue of many degrees, rich violet, crimson, purple, rose and other shades which defy description. And while the color effect appeals strongly, perhaps even greater do the waving picturesque flowers appeal—flowers comparable to nothing but themselves, whose beauty no pen-picture could possibly portray.—E. H. JENKINS in *The Garden* (English).

HARDY FERNS FOR SHADY PLACES

IN a great many gardens there are numerous situations where, owing to the shade of adjoining buildings, walls, or overhanging trees, the majority of flowering plants refuse to thrive, and consequently these places are, more often than not, far from attractive for the greater part of the year. This ought not to be. In the many and varied families of hardy Ferns we may find beautiful and interesting plants that can, with a comparatively small amount of trouble, be induced to grow well in such places and give us their graceful fronds in abundance for many months of the year. Apart from their usefulness in transforming erstwhile ugly spots into dales of beauty, these hardy Ferns are well worth a place in the best gardens, because no other plants will provide us with such an atmosphere of refreshing coolness on a scorching hot day in Mid-Summer. Nor must we forget their Winter beauty. If the dead fronds are allowed to remain *in situ*, as they should be, until well into the Spring, they provide quite a study in russets and varying shades of brown during the dull days of Winter, when interesting features in the outdoor garden are none too plentiful.

Another feature that ought not to be overlooked when hardy Ferns are under consideration is their almost unique suitability for association with flowering plants that either appreciate fairly dense shade in Summer or which flower early in the year, when the biting blasts of the slowly lengthening days sweep over the land, and when the shelter of the dead fronds is so welcome to their floral neighbors. One has vivid recollections of the companionship of a riotous mass of hardy Ferns and stately Foxgloves in a woodland glade, where shade and moisture, with an abundance of decaying vegetable matter in the soil, were evidently highly appreciated by the twain. But even more vivid is the recollection of a woodland scene in the cold, almost cheerless days of January and February, when Snowdrops, Scillas, Christmas Roses, hardy Cyclamen, the dainty little *Narcissus minimus*, and its larger, though almost equally early *confrère*, *pallidus praecox*, were nestling their flowers contentedly in the curled russet fronds of the Ferns. Such a scene is possible in every garden where tall trees, excepting Beeches and those of an evergreen character, are present.

However we may decide to group or associate our hardy Ferns with other plants, a few points are essential for successful cultivation. It will have been gathered, from what has already been said, that the majority of hardy Ferns suitable for growing in our gardens like a cool situation and soil that is reasonably moist and contains a good proportion of decaying vegetable matter, generally in the form of dead leaves. This is not always easy to arrange, particularly where the plants are to be grown under the shade of trees; but even though the soil there is not so moist as we would like, many of the Shield Ferns or Polystichums, the Broad Buckler Fern (*Lastrea dilatata*) and the Lady and Male Ferns will thrive. But previous to planting, the soil should be well and deeply dug—as deeply as the roots of the trees will allow—and if poor, some good fibrous loam, old decayed leaves and some short, well-rotted manure thoroughly mixed with it. Hardy Ferns that are grown under trees in this way *must* have generous supplies of water during hot weather, but this is not, in most gardens, difficult to arrange, and the results will certainly more than compensate the owner for the outlay.

Where the shade is supplied by surrounding, not overhanging, trees, boulders of rock, buildings or walls, and where the soil is naturally moist, the many beautiful forms of the Hart's-tongue Fern will thrive to perfection. The variation among these is really wonderful, yet I must confess that few appeal to me more than the plain-fronded type. In too many the foliage seems distorted and far from what Nature intended this beautiful Fern to be. With its roots almost in water, that most noble of all hardy Ferns, the Royal Fern, *Osmunda regalis*, and its dwarfer variety *gracilis*, will make a stately feature in the shaded garden. One of the most pleasing features of a rock garden in Summer is its moist corner bedecked with hardy Ferns, or the tumbling cascade, the sides of which are fringed with swaying, graceful green fronds of perhaps that gem of hardy plants, the Killarney Fern, the foliage of which must ever be covered with a film of moisture to preserve it from the least suspicion of a drying wind. The subject is one that could be pursued indefinitely, so numerous and varied are the Ferns which are hardy with us; but enough has been said to draw attention to their usefulness and attractiveness at all seasons.

PLANT YOUR TREES CAREFULLY

IF trees are to live and thrive they must be planted right and cared for properly thereafter, otherwise it is a waste of time and money to plant at all. If you are among the number who contemplate tree planting this Spring, either on a large or small scale, resolve to give the work the care and attention it deserves. An observance of the following simple directions should help you to succeed.

Be sure to get strong, healthy trees, with good roots. Dig large holes, much larger than the actual spread of the roots, and see that good soil is provided for filling in. Spread out the roots carefully, each little fibre in its natural direction. Work the earth in about the roots by hand, as it is filled in; when nearly filled in, wet down thoroughly (a pail of water to each tree is none too much), then fill in the remainder of the soil and press down firmly to prevent drying out. If the location is exposed it is well to fasten the tree to a stout stake driven firmly into the ground, but be sure to use some soft material for tying about the body that will not injure the bark by chafing. If protracted dry weather ensues, water at frequent intervals. A mulch of straw or other coarse material, or even a few large stones that will shade the ground about the tree will prove beneficial. While planting, or making ready to plant, never allow exposure of the roots to sun and wind. Carelessness in this respect is a frequent cause of failure.

When trees are removed from the nursery, many of the fine rootlets and, in some cases, the larger roots are mutilated or destroyed. To correspond with this loss of roots or feeders, the top of the tree should be pruned and properly shaped before planting. It is better to be over-severe in this pruning than to err in the opposite direction. Remember that a small mass of roots cannot gather sufficient nourishment to feed a large top.

If you intend to work there is no better place than right where you are; if you do not intend to go to work, you cannot get along anywhere. Squirming and crawling about from place to place can do no good.—*Abraham Lincoln*.

GOLD MEDAL TO GEORGE F. STEWART

THE gold medal of the National Association of Gardeners has been awarded for the first time to George F. Stewart, gardener to Arthur Lyman of Waltham, Mass., for a collection of nine plants of *Calceolarias*, which were exhibited at Horticultural Hall, Boston, on May 15.

The committee appointed by President Jensen to judge the exhibit, Wm. N. Craig, Duncan Finlayson, and Walter H. Golby, reported that it deemed the exhibit well worth the highest award of the national association.

Mr. Stewart, the grower of the plants, writes of them as follows: "Somewhere around 1906, I crossed *Calceolaria hybrida* with *Cal. rugosa*, variety Golden Gem. The last named was the female, or seed bearing parent. The male, or pollen parent, was a yellow *hybrida* with brown spots, a plant of compact, short-jointed growth, of the well-known James' Strain. I do not now remember how many plants I raised and flowered of that cross, but there were quite a number, and I flowered them all in two and a half inch pots. My aim was

to get a *Calceolaria* with pale yellow flowers of somewhat freer growth than either *rugosa* or *hybrida*, which could be raised freely from cuttings. Any one who has raised *Calceolarias* from seed, knows how hard it is to get them safely through the hot months of Summer. There were a number of different and interesting plants

among the plants flowered from the above cross, but not knowing anything of "Mendel's Laws" or plant breeding of any kind, I threw them all away except the yellow one, now known as *Cal. Stewartii*, which I then thought came nearest what I was after. The other three varieties, Medford Gem, Baileri, and Lymanii, are the same cross, using a different color of the same strain of *hybrida*. The last named variety has, I consider, the most compact and freest growing habit of any I have yet raised and was most ad-



One of the Plants of the Exhibit of *Calceolarias* awarded the National Association of Gardeners' Gold Medal.

mired on that account at the exhibition. As to the different shades of color, that is a matter of taste."

Sometime in the near future, Mr. Stewart will contribute some notes to the columns of the GARDENERS' CHRONICLE on the culture of these plants.

MANURING ORCHARDS

Arthur Smith

GENERALLY speaking apple orchards last year yielded heavy crops of fruit, and the strain of a load of fruit is undoubtedly felt by the trees, which is often shown by lack of growth and early falling of the leaves. It is obvious, therefore, that such trees should be manured during the Winter, or early Spring.

Fruit-growers do not always find it easy to decide whether their orchards need manuring. It has been laid down as a rough guide that feeding is required when trees make less than a foot of young growth besides bearing a crop of fruit; but this would hardly apply to old trees which cannot be expected to make so much growth. At the same time it is the older trees which require, and which will give good returns for manuring, and these returns are most apparent in the increased size and quality of fruit. While some advocate manuring orchards only once in three years, the writer has found it pays to manure comparatively old orchards every year. Of course the trees were all healthy and the previous want of results had been caused by want of food, but naturally it would not be desirable to manure trees with decaying trunks that are dying from extreme old age.

Farmyard or stable manure undoubtedly gives the most satisfactory results, indeed, on many soils chemical

fertilizers give little benefit which can be traced, although one can hardly imagine that they have no influence.

While fruit trees are young, manures should be applied to a space under each tree a couple of feet beyond the spread of the branches, and in the case of an orchard that has done at all well for fifteen years the entire surface of the ground should be manured all over. Manure for fruit trees should be allowed to remain upon the surface and never spaded or plowed under, so as to keep the roots near the top and to discourage them from penetrating too deeply into the subsoil, as the latter results in the production of unfruitful wood.

While the starving of fruit trees is a mistake which is clearly shown by poor crops and small fruit, it is, however, quite possible to give too much manure—especially in the case of young trees—the result being rank growth rather than fruit. Trees that are growing too fast and failing to bear should certainly not be manured, no matter how long since they received the last application. In this connection, when considering the manuring of an entire orchard, it will sometimes be advisable to leave some varieties, or even trees of the same variety, unmanured, or to give some a much lighter application than others; in these respects the value of expert knowledge will be apparent, and also a knowledge of the trees' behavior in the past.

A HORTICULTURAL HALL FOR NEW YORK

A MOVEMENT has been started to found a horticultural hall in New York City, which is to be representative of American horticulture. At a recent meeting of the Horticultural Society of New York, John Scheepers of New York was empowered to organize a committee, the members of which will be announced shortly to be composed of prominent men and women of America interested in horticulture. After this committee has been organized, various sub-committees will be appointed and a campaign started to raise the necessary funds to carry out the project.

The present plans are to erect a structure on a centrally located site in New York City. In its architectural design it is proposed to make the building somewhat on the lines of the Grand Palais and the Petit Palais of the Champs Elysées, Paris. A main exhibition hall in which the International Flower Shows and other events of similar nature may be held is to be provided, besides meeting rooms, lecture halls, and general offices to be devoted entirely to the horticultural interests.

The interest already manifested on the part of those who are willing to lend their names to the movement and give their support to it, furnishes assurance that it will be successfully carried out.



Grand Palais and Petite Palais, Champs Elysées, Paris, after which the proposed Horticultural Hall for New York City will be modelled.

THE CULTIVATION OF FUCHSIAS

THERE are very few classes of plants that can be put to as many different uses as the numerous forms of *Fuchsia* which we have now in our gardens. For the embellishment of the greenhouse or conservatory they may be grown either as bushes, pyramids or standards, according to individual taste. The tendency to train them in standard form is decidedly on the increase, and certainly the flowers, owing to their drooping nature, are seen to considerable advantage when grown in this way. The looser-habited kinds are also very pretty when trained to roof or rafter, under which conditions they will keep up a display of bloom throughout the entire season.

Outdoors during the Summer they are invaluable, either as large specimens sunk in the turf or grouped in a bed, thickly or thinly, according to individual fancy. When disposed over the surface of a bed at such a distance that each individual has space to show its true character, and the ground underneath is clothed with some low-growing flowering plant, such as the bedding

Violas or Harrison's Musk, a very pretty effect is produced. Some of the dwarf-growing Fuchsias themselves may, if preferred, be used for carpeting purposes. In any enumeration of the uses to which Fuchsias may be put, the hardy kinds must on no account be passed over, as they flower profusely during the latter part of the Summer, having small, gracefully reflexed blossoms.

A desirable feature of the different Fuchsias is their simple cultural requirements, which stands them in good stead in small gardens as well as in more pretentious establishments. The named varieties are readily increased by cuttings, which may be taken at any time during the growing season. The best time, however, is in the Spring months, when the plants, just awakened from their Winter's sleep, push out new shoots. As soon as these shoots are from 2½ inches to 3 inches long, they form very suitable cuttings. If the bottom pair of leaves is removed and the cuttings inserted into pots of light, sandy soil, they will, in a close propagating case in a gentle heat, strike root in about a fortnight. In the Summer they will strike readily without any artificial heat, provided they are kept close and shaded.

When rooted, they must be potted singly and shifted into larger pots as required. A suitable compost for all Fuchsias may be made up of two parts of loam to one



part each of leaf mold and well-decayed cow manure, with about half a part of sand, the whole being thoroughly incorporated together.

If the young plants are intended to be grown as bushes, they should have the growing points pinched out in order to induce the formation of side shoots; if as pyramids, be tied to an upright stick and the development of side branches encouraged; while for standards a good stake is necessary, and the removal of all side shoots till the required height is attained. The pots should be well drained, as Fuchsias need a liberal quantity of water during the growing season, yet at the same time they very much resent stagnant moisture.

In the Winter, Fuchsias lose their leaves, so that they may be readily kept at that season anywhere just safe from frost. They need then little or no water. Taken into the greenhouse in the Spring and watered, they will, under the influence of light, air and moisture, quickly start into growth. When taken from their Winter quarters, any straggling shoots may be shortened back in order to ensure good shapely specimens.—*Gardening*

Ornamental Flowering Trees

ARBORUM AMATOR

(Continued)

THESE may be used on grounds of moderate area as single specimens on open spaces, or for outlining driveways, or along the boundary lines, or in corners.

THE SOUTHERN CATALPA (*Catalpa bignonioides*) is hardy as far north as New England, and is of very rapid growth, and thrives in almost any soil. It has a spreading habit of growth and carries many branches. In mid-June its panicles of fragrant white flowers, spotted with violet and yellow, appear amid its heart-shaped leaves.

The poetess Phoebe Cary brings before our mind's eye in the following lines the shape of the Southern Catalpa:

"Near the porch grows the broad catalpa tree,
And o'er it the grand twistaria
Born to the purple of royalty."

THE EMPRESS TREE (*Pawlonia imperialis*), a relative of the Catalpa, resembles that tree both in foliage and habit of growth. This noble, broad headed tree, though hardy as far north as Massachusetts, does not bloom regularly north of New York City. It bears in great profusion in June panicles of very fragrant, violet colored, trumpet-shaped flowers resembling those of the foxglove. Forty-eight of these trees planted in a row just inside the street boundary line on the Gerkin estate on King's Highway, Brooklyn, N. Y., are splendid specimens of this tree, and present a beautiful sight when in bloom. The odor of their flowers is delightful and so penetrating that it is carried a considerable distance by the winds. So numerous are the blooms of the Pawlonia that when they fall they cover all the space beneath the tree with a beautiful violet blanket. The leaves of this tree are heart shaped and often on young trees eighteen inches or more in diameter. The growth of the Pawlonia is very rapid, and trees from the seed, which are produced in great numbers, flower when no more than eight or ten years old. This tree is a native of Japan and China, and the first specimens are said to have been imported by the late Robert Buist, of Philadelphia.

THE NATIVE RED BUD TREE (*Cercis Canadensis*) bears on its leafless twigs in May a profusion of rosy purple flowers, arranged in fascicles directly on the bark. There is a white flowering variety (*alba*) of this species. The species *Japonica* is a lower growing tree bearing larger flowers more thickly placed, and *silvestris*, the European Red Bud, has brighter purple flowers. All the Red Buds have a branching habit of growth. *Canadensis* and its variety, *alba*, are hardy, but the other species are not hardy farther north than New York.

The Red Bud is sometimes called the Judas Tree, because of the tradition that the betrayer of our Savior hanged himself on a tree of this kind. Bulwer Lytton speaks of it by this name in one of his verses:

"Your Judas tree begins to shed those crimson buds
of his."

THE YELLOW WOOD (*Cladrastis*) is a hardy native tree. The species, *tinctoris*, bears white, pea-shaped flowers, which droop gracefully from the ends of its branches, while the species *Amurensis* produces its flowers in erect clusters, and the standard petal of each

flower has on it a yellow spot. The pinnate foliage of this tree adds greatly to the beauty of its June blooms, and in the Autumn assumes a bright, yellow color.

THE SORREL OR SOUR WOOD TREE (*Oxydendrum arboreum* or *Andromeda arborea*) in Mid-summer bears tiny white bells in loose clusters. The light brown seed pods also make this tree attractive during its seeding period and after its blooming and seeding season is over its long, shining, green leaves turn to a bronzy-red, and later to orange, and prolong its beauty into Autumn. This tree is native to the mountains of Pennsylvania and southward, but is quite hardy in the middle northern States. The name, Sour Wood, is given this tree because of the acidity of its leaves, and for the same reason it is called Sorrel Tree, as the leaves of Sorrel are acid. The flowers coming in slender terminal panicles from their form and beauty have caused the tree to be called sometimes Lily of the Valley Tree. Though in a wild state it sometimes reaches a height of 40 to 50 feet, it begins to bloom when no more than three feet high, and it can be grown as a shrub as well as a tree.

YULAN MAGNOLIA (*Magnolia conspicua*), a native of Japan and China, is a tree of spreading habit of growth. This is one of the most showy of the magnolias, especially in April and May, when its sweet scented flowers appear often six inches across, campanulate in form, and of purest white.

THE UMBRELLA MAGNOLIA (*Magnolia tripetala*), a native of Pennsylvania, and farther south, derives its common name from its spreading habit. Its very large May flowers are showy, but their odor is rather unpleasant.

MAGNOLIA MACROPHYLLA. One of the pronounced features of *Magnolia macrophylla*, a native of Kentucky and farther south, is the leaves, one to three feet long, which clothe its spreading branches. Entirely in keeping with these are its extremely large, cup shaped, fragrant flowers, white, with a purple base, which appear in May and June. It might well be called the Long Leaf Magnolia, which is a translation of its specific name, *macrophylla*.

FRASER'S MAGNOLIA (*Magnolia Fraseri*) is indigenous from Virginia west to Mississippi, and south to Florida. Its sweet scented white flowers are followed by bright rose-red fruits.

In the conclusion of this article in our next issue the large ornamental flowering trees will be mentioned and described.

Laying out grounds, as it is called, may be considered as a liberal art, in some sort like poetry and painting; and its object, like that of all the liberal arts, is, or ought to be, to move the affections under the control of good sense. If this be so when we are merely putting together words or colors, how much more ought the feeling to prevail when we are in the midst of the realities of things; of the beauty and harmony, of the joy and happiness of living creatures; of men and children, of birds and beasts, of hills and streams, and trees and flowers, with the changes of night and day, evening and morning, Summer and Winter, and all their unwearied actions and energies.

WORDSWORTH.

A Lesson on Plant Parasites and Pests

And some of the Principles underlying their Prevention and Control.

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

BOTH in the animal and in the vegetable kingdoms, disease, death and decay, are (leaving out of consideration the results of physical force) manifestations of other forms of life and are generally brought about by what are known as parasites, which are organisms having no existence except in connection with a host, feeding entirely upon it, and which also in many cases live and multiply upon some other organism.

Some parasites are more or less essential to the health and well-being of the host they inhabit, such as for example, in the case of plants, the micro-organisms occupying the nodules upon the roots of clover and other legumes; there are also some parasites which are beneficial to horticulture by reason of the fact that they use as hosts other parasites which are harmful, as the examples of the organism destroying the San Jose scale, and the Ichneumon flies which lay their eggs in other insect larvae, and the larvae resulting from such eggs, living in the interior of their larval host, prevent the latter from pupating and carrying on its existence.

Harmful parasites are divided into three groups, insects, fungi and bacteria, all being embraced under the term "pests," there being also other pests belonging to the insect class which are not strictly parasites by reason of the fact that while they feed upon plants, their life history is carried on separately.

It is sometimes asked why "all these pests which attack crops are so abundant," the implication being that in bygone days no such unpleasantness had to be faced, or, if at all, only in a minor degree. While it is undoubtedly true that there has been an apparent increase in the number of enemies attacking ornamental plants and crops, yet there is no doubt that crops had their enemies in ancient days; this may be inferred by the allusions to the canker worm and the palmer worm in Biblical history, and in the writings of the ancient Greeks and Romans frequent mention is made of smuts, mildews, rusts, etc. At any rate we may be sure that pests existed before the era of cultivated crops. Nevertheless it is obvious that not only have the number of enemies found in our gardens and farms increased, but many kinds are now found in greater numbers. There may be several explanations of this. The most important is probably the great increase in the amount of land under crops, and the extensive and intensive crop-cultivation of modern times, with the consequent increase in the number of hosts which each pest prefers. Their food is therefore more abundant and more easily accessible, consequently they are able to increase and multiply with ease and rapidity. Practically every pest can be found upon the wild congeners of its favorite cultivated host, and, further, epidemics may be frequently observed among weeds and wild flowers, to say nothing of wild trees and shrubs. In this connection the clearing up of roadsides, fence rows and many other waste places would do much to reduce parasitic troubles by removing the breeding places of the parasites.

Whatever the causes, the fact remains that pests have greatly increased in virulence the past few decades, and that, were no control measures put into force, a more or less extensive destruction of plants would ensue and crops would be reduced to a minimum.

Up to now, chemical methods, especially spraying, have been the most efficient. They are doubtless the most direct in action, and usually give the quickest results, especially in connection with insect pests. But one must remember that the whole question of pest control is really in its infancy; and because spraying is the best means available at present, it by no means follows that no other methods will not subsequently prove to be of greater use.

Already much interesting work has been done on the parasites of economic insects, and the success which has been obtained in this direction indicates other and possibly more far-reaching means of control. At present, however, spraying undoubtedly holds the field and few would go so far as to prophesy that it will ever be found possible to abandon it; it may be well therefore to consider the question from as broad a point of view as possible.

Speaking generally, those having a direct interest in plant parasites may be divided into three classes: (1) Those who seem to think that spraying is a necessary thing *in itself*. They appear to regard it in much the same way as many people regard patent medicines, with an eye of faith, and they with faith spray without knowing whether their plants happen to be afflicted with the pests they spray against or not, and in this way much blind and unprofitable spraying is done. (This remark is disconnected with the necessity, to be enlarged upon

later, of using spraying as an insurance against fungus diseases.) (2) Those who know more or less about the life history of the pests they desire to control, and who, among other things, realize the difference between actually killing the pest itself and preventing the possibility of its existence; and (3) those who never trouble themselves about the matter at all.

There are several essentials necessary for successful spraying, two of the fundamental ones being, to know what parasite the plant is suffering from, and a knowledge of its life history. By way of illustrating the importance of this knowledge, the life history of one of the common apple pests, *Aphis sorbi*, or the rosy apple-aphis, may be briefly given. In the Winter it exists on the apple tree as little black shining eggs, laid chiefly on or near the leaf-scars of the fruit-spurs. Toward the end of April, earlier or later according to climate, the eggs hatch and purplish-green larvae come out which immediately begin to feed upon the under side of the leaves. At first it does nothing but feed, moult its skin and grow, but after a time it becomes fully grown and is then purplish, mealy and rather globular in form, and at this stage is known as a queen-mother. After reaching this condition it begins to "bud-off" little pinkish larvae which immediately insert their probosces into the under side of the leaves, causing extensive curling. This production of young by the process known as budding takes place without the intervention of a male. The budded-off young, when fully grown, repeat the process, and so it goes on through several generations. About the end of June, winged individuals appear, and these no longer feed upon the apple leaves, but fly to another host plant, so that about the end of July the apple tree is free from this insect. In September, winged immigrants from the second host-plant fly back to the apple and produce a generation of winged males and wingless females. These females soon begin to lay their eggs on the apple twigs, and their life history is thus completed.

In considering this history it will be apparent that from a spraying point of view one may divide it into four periods: (1) The egg stage; (2) The young larval stage, before there is much or any leaf-curling and before the queen-mothers have commenced to bud-off young; (3) The viviparous stage, or when active reproduction of perfect insects is going on and when the leaves are curled; (4) The Autumn stage when males and females are present but no leaf-curling is caused.

Stages (1) and (3) do not lend themselves to treatment. It is not practically possible to destroy aphis' eggs by a wash, so that spraying in Winter against this pest has so far failed. The viviparous stage is equally difficult, owing to the leaf-curl preventing the spray from coming into contact with the insect. This leaves the two other stages in which the aphis is comparatively vulnerable, but (4) presents the difficulty of excessive foliage, and therefore it is plain that so far as this particular pest is concerned, the best time to spray for it is undoubtedly immediately after the eggs hatch out in the spring, at which time we can attack it with the greatest prospect of success. A knowledge of an insect's life history along these lines is thus an essential for success in its control.

In addition to the identification of the insect and a knowledge of its life history, it is important to know how the insect feeds so as to know the kind of spray-fluid to employ. All members of the Aphis family and other sucking insects feed upon the juices they suck from the interior of the leaf or plant-stem, they therefore cannot be killed by a stomach poison applied to the surface of the plant but must be destroyed with something which kills by actual contact with the insect. On the other hand contact poisons, unless they are strong enough to kill the plant are of no avail against a pest like the potato beetle, which has to be controlled by stomach poisons.

Therefore insect pests naturally divide themselves into two classes: Those which feed by sucking plant juices, and those which feed by actually eating the leaf or other part of a plant. This division brings about the necessity of having two kinds of available insecticides, contact washes and stomach poisons.

The principle underlying the action of stomach poisons is simple. The material is sprayed upon the plant, and any insect feeding upon it absorbs a certain amount of poison and dies. It is necessary for the poison to be insoluble in water, as some soluble poisons are nearly always harmful to the plant. At the same time they must be of such a nature that they will be acted upon by the insect's digestive juices and brought into a soluble form. Today, lead arsenate is the great stand-by for this purpose owing to its freedom from harming the plant; its

effectiveness, and to the fact that it can be prepared in the form of a paste. It has recently been suggested that lime arsenate is quite as effective, while being cheaper.

When an insect feeds by sucking the juices from a plant instead of biting it, it is clearly impossible to poison it through the stomach. A considerable number of contact insecticides exist and there is room for much work on the precise nature of their action, but they all agree in acting on the insect either through the skin or by stopping up the breathing tubes. These sucking insects do not breathe through their mouths for they have none, but through tubes opening in various parts of their bodies.

The question naturally arises as to what are the essentials for an effective contact insecticide. The very name supplies the answer. Firstly it must make contact and, secondly, it must be insect killing. By making contact it is meant that the insecticide must wet the insect and have the power of penetrating the skin, which is frequently woolly. Water will not do this. In some instances water is used for washing off by physical force insects from plants, such as, for example, red spider, but this alleviates the trouble only temporarily as the insects are not killed. To be effective, when a drop of contact insecticide falls upon an insect, it must have the power of spreading over it and penetrating its woolly covering. To bring this about various forms of emulsions are used together with nicotine. Nicotine is practically an ideal insecticide since it acts both as a contact and as a stomach poison, but unfortunately it is expensive.

It does not appear necessary to go into the question of the manufacture of insecticides as there are proprietary spray fluids, together with the ordinary compounds, which have stood the test of time and which cause it to be not worth while to mix one's own, which in any case is an unsatisfactory procedure, especially in small quantities. There is, however, considerable room for chemical research in the direction of producing simple substances having a contact insecticide value.

As previously mentioned, it is important to attack sucking insects at the most vulnerable period of their lives, which period in connection with outdoor plants is invariably just as the foliage begins to appear, or in the case of those which flower before the foliage comes out, just as the flowers commence to open. Further, as not only do the eggs of insects hatch out over a somewhat extended period, and also as, in the case of aphids, viviparous reproduction goes on more or less continually for a certain period, several sprayings at intervals of a few days are necessary. In connection with the various species of plants the most vulnerable period is not at the same time, but by keeping watch for their pests' first appearance and dealing with them at once they are more easily kept under control, and bad and more damaging attacks are avoided. For greenhouse work frequent sprayings are necessary, and by this means even white fly can be exterminated and the dangerous cyanide fumigation avoided. To be effective, especially in the latter connection, the spraying must be thoroughly done and all the underneath parts of leaves covered. While in the case of all plant houses, fumigation by burning tobacco in some form may be effective by reason of the fact that the plants will be entirely surrounded by the fumes, different species of plants vary considerably in the amount of tobacco smoke they will withstand, and it is as easy to kill plants by this method as it is insects.

The control of parasites belonging to the fungus order stands upon a totally different footing to that of insects. In the latter case we can only bring direct treatment to bear after they appear, but in connection with fungi, efforts to successful control must be directed to prevention because there is practically no cure for any fungous disease, that is to say, so far as any part of a plant affected by the disease is concerned.

Fungi are propagated by means of spores, which are for the most part individually invisible, and which float about in the atmosphere and are wafted from one district to another by means of air currents. When a spore falls upon a leaf or other part of a plant, it will under suitable conditions germinate and the tube or root brought into existence by the act of germination will penetrate through the outer covering of some part of the plant, generally the leaf, or through a wound. As soon as the germinating tube enters the plant it commences to feed upon and spread through the plant tissue, in which stage it is known as mycelium and its effects are invisible to the naked eye outwardly. When we see the effect of this growth in the forms of rust, black spot, etc., the harm has already been accomplished; the mycelium of the fungus has destroyed that part of the plant in which it lived and upon which the outward manifestations of it appear, and the latter is really the fruiting stage of the fungus. This fruiting stage upon a large scale is seen in the case of the edible mushroom and other fungi of like nature. Their mycelium or spawn must first live and grow in a suitable medium and the mushrooms or toadstools are merely the fruiting stages.

It is therefore clear that, as above mentioned, our efforts must be mainly along the lines of preventing the germination of the fungus spores in the first instance; only so far as we can kill spores by spraying is the use of fungicide after manifestation any use, and also of course, as far as the latter operation will prevent any further germination.

The underlying principle of spraying against fungi is to look upon it as insurance. Spray before there is any appearance of trouble and keep it up at frequent intervals. Fungi generally delight in wet cool weather and they give much less trouble in seasons which are dry and warm; it is therefore necessary to spray with greater frequency in seasons of the former character.

Some species of fungi produce spores of more than one character, and in most cases there is a special resting spore which will remain dormant through the Winter and there is no doubt that spores in general are capable of a very extended period of dormant life, awaiting suitable conditions and the presence of their host to commence their activities.

Many, too, have more than one host, sometimes using one in the Summer and another in the Winter, and if one of these hosts is entirely absent they cannot exist at all. In this connection the extermination of all species of *Ribes* would exterminate the White Pine Blister Rust.

Spores of many species are undoubtedly disseminated by seeds and we believe that it will become part of the ordinary routine to treat seeds previously to sowing with some preparation which will kill any fungus spores adhering to them.

Then, too, fungus spores undoubtedly remain in the soil on or near which diseased plants have been growing. In relation to this, sterilization of the soil where practicable is of great value, as is also the use of a fungicide upon the soil before the plants commence to grow. This latter practice has, for instance, been found to be of great use in connection with Holly-hock rust. Then again many fungi work entirely in the soil and cause disease in some part of the underground plant structures, as for example, that causing club-root in members of the cabbage family always lives in the soil, and may be controlled by heavy dressings of lime to affected soil.

In cases of the latter character, and in more or less all others a rotation of crops assists materially and considerably in prevention.

As a general rule, weak and unthrifty plants are the first to be attacked by disease, a fact which can be frequently noticed, especially in connection with the peach leaf-curl caused by a fungus known as *Exoascus deformans*. For this, the usual control method is spraying just before the leaves appear. The effect of this disease is to destroy the peach leaves and therefore to destroy a part of the tree's digestive organs thereby reducing growth and rendering the fruit more or less useless. But where peach trees are growing under the best conditions and are making luxuriant growth the effect of the leaf-curl fungus is seen to be almost nil. In practically all cases a healthy plant supplied with a properly balanced food will to a considerable extent resist disease. We must emphasize the necessity for properly balanced feeding as a factor in healthy growth and in disease resistance; the reverse of this, as for instance, supplying plants with an excessive amount of available nitrogen in a chemical form, increases their susceptibility, especially in wet seasons, to fungous diseases. This has been particularly noticed in the rust of cereals and in the mildew of roses.

A direct way of minimizing the losses caused by fungi is to select and cultivate disease-resistant plants. It is very frequently seen that when many varieties of any plant are grown under the same conditions they show considerable difference in their capacity to resist disease; a few may even be found which are practically immune. Unfortunately immunities to any particular disease is not necessarily associated with other characteristics equally desirable from the point of view of the cultivator. For example, some varieties of potatoes are known to possess considerable capacity to withstand the blight known as *Phytophthora infestans*, but they are little grown on account of the bad table qualities of their tubers; and, conversely, some producing the most desirable tubers are very susceptible to this disease.

The question here arises as to whether immunity to disease, and its converse susceptibility, are heritable characters. If so, it would seem possible by cross-breeding to associate the valuable feature of immunity with other characteristics the cultivator desires. While some work along the lines of selection and breeding has been done by seed growers and others, and which has resulted in new varieties less susceptible than older ones, more precise knowledge is necessary with regard to the mode of inheritance of this feature before really scientific data can be obtained. There must be a definite reason why certain plants remain immune when every chance of infection is present. The selection of and breeding from immune specimens is, while valuable, a "rule-of-thumb" method. The "why" is the question to be settled, and to this end a better knowledge of

plant pathology appears to be the only hope of elucidating the matter, and should be forwarded.

In some cases, however, we have facts which prove that among some genera of plants, species and varieties are to be found which are naturally immune to a disease to which other species of the same genera are very susceptible. The most marked case is the Rose and the mildew to which it is greatly subject.

The incidence of the rose-mildew on the newer races of Roses supports the fact that immunity and susceptibility are transferable on cross-breeding, and the evidence in this direction is the more valuable because the pedigrees of many are known with some degree of certainty.

The new race of Wichuraiana Roses, which has so altered the appearance of our rose gardens in the last few years, gives the most convincing proof of the fact. These Wichuraianas are descended from *Rosa Wichuraiana*, crossed with various Teas, Hybrid Teas, Hybrid Perpetuals, etc. The species itself shows an intense degree of resistance to mildew, while this is not necessarily true of the other parents. It is customary to speak of the whole class as being mildew proof, the hard, polished leaves being supposed to be impenetrable by the fungus. As a matter of fact many of this class are badly attacked, and if one looks up the pedigrees of these latter varieties, it will be found that susceptible forms have been used in crossing. Space will not permit us to follow this interesting phase of our subject very far, but before leaving it a few instances confirming the idea will be presented.

We know that the ubiquitous "Dorothy Perkins" is frequently badly mildewed, and we also know that it has not inherited this trait from *Rosa Wichuraiana*, its seed parent, but from "Mrs. Sharman Crawford," its pollen parent, which is a terror for mildew.

One of the grandest Rambler Roses of modern times is "American Pillar," a rose with glorious mildew proof foliage and splendid trusses of bloom. This was raised by Dr. Van Fleet from *R. Wichuraiana* and *R. setigera*, neither of which are subject to mildew.

On the other hand *R. multiflora*, another Japanese species, is distinctly susceptible to mildew, and the fact that "Crimson Rambler" is very subject to it is explained by the fact that *multiflora* is one of its parents.

There is no doubt that the banishment of rose mildew from our gardens is to a large extent possible by the production of mildew resisting varieties, but I do not see how any great success in this direction is likely so long as so many hybridists continue their present system of, so far as mildew is concerned, crossing Hybrid Teas with each other. At the same time while there is no doubt there are many Roses which are more or less immune from disease, there is a considerable amount of mildew which is increased by errors in cultivation, such as over-dosing with chemical manures, carelessness in watering, and by any other conditions which produce a softness in foliage that renders it an easier prey to the fungi.

The most difficult of plant diseases to combat are those caused by bacteria, the most pronounced being known as "fire-blight" on fruit trees, especially the Pear which this disease frequently kills. The disease is caused by a micro-organism entering through the growing points of the twigs and thrives in the soft, succulent parts. Gradually the bacteria work down the stem, killing the tissue and causing death of the affected parts.

Spraying is of no use, so far as our present knowledge goes, in connection with bacterial disease, the only method which has been partially successful is antiseptic pruning.

The symptoms are that flowers, young fruit, leaves and twigs turn black and die. It allowed to persist limbs also have sunken cankers form on them and sometimes an entire branch, or all the branches are killed.

Upon its first appearance the diseased portion should be cut off together with eighteen inches of healthy growth, first treating the cutting tool with an antiseptic in the form of corrosive sublimate, one part to one thousand of water, also apply it to the wound made by the pruning. If the wound is more than half an inch in diameter it should be subsequently dressed with creosote, or tar. All prunings should be promptly burned. It is generally believed that trees are more subject to this disease when they are making excessive growth; therefore it is advisable to avoid too much stimulating fertilizers. The disease is, however, liable to attack comparatively old trees growing upon poor soil which are making little new growth. Some varieties of pears and apples seem to be relatively immune, such as the Kieffer and Angouleme pears, and the Jonathan and Northern Spy apples. Fire-blight is found upon the hawthorn and other similar wild plants of the same family, therefore thickets and old hedgerows containing wild trees should be cleared away.

With all the numerous parasites of the various classes, and there are some which it may not be strictly correct to term parasitic, the most important underlying factor in preventing

and controlling them is to know their life history, and in this connection the most learned scientists who have made a life study of them, do not know it all.

Nevertheless, as previously pointed out, a close study of the life-history of a pest often reveals some weak spot where it is especially vulnerable, and a knowledge of the methods of natural infection and of conditions favoring the speed of any disease, fungous or bacterial, or of the reproduction of any insect pest, has and will often lead to effective means of prevention and control. To these ends there is a vast amount of room for experimental work under field conditions, as laboratory experiments do not go far enough nor are they in general sufficiently conclusive. Unfortunately, to give the experiments any real value, the first thing is to bring about the existence of the trouble, before any really scientific means of dealing with it can be formulated. However, much has already been learned, and considerable progress made in control and prevention by means of spraying. In bringing this necessarily sketchy lesson to a close a restatement of some of the principal points will be in order.

In spraying, thoroughness is very important, so that all parts of the host and every insect upon it are covered with the fluid. The finer the spray the better, and it should reach the plant as nearly in the form of mist as possible.

Care should be taken to know whether insect trouble is being caused by chewing or by sucking insects, or by both, and the spraying material selected accordingly.

Do not wait until considerable damage is apparent, but keep a close watch so as to be able to start effective measures of control immediately the pest is in existence, and make the intervals, when successive sprayings are necessary, not longer than a few days.

For fungus pests prevention must be first considered and spraying must be commenced before there is any sign of disease.

Crops subject to disease or pests affecting their roots, tubers, etc., in the soil, should not be grown upon the same ground in successive seasons and the longer the interval the better. In these cases special treatment of the soil, such as lime for "club-root" and sterilizing for those like "root-knot" should be practiced.

Keep cultivated ground in a sweet, clean condition, and maintain the available plant food in a state of balance as far as possible, and especially avoid excessive applications of available nitrogen as being likely to encourage rust, mildew, etc.

In addition to the latter, rusts and other similar diseases are increased by cultivating, or otherwise handling, string beans and some other crops when they are wet with rain or dew; this practice should be therefore avoided.

Diseases can be, and frequently are, transmitted by seeds and until seedsmen can guarantee their seeds free from spores it is well to disinfect them immediately before sowing by a solution of formaline; this disinfection should also be applied to seed potatoes.

Keep the garden and its surroundings as far as one's control extends always in the highest sanitary condition, clear from weeds especially those affected with similar diseases to those of cultivated plants, or which act as intermediary hosts for any disease or pest; burn all prunings and remains of diseased plants at the earliest opportunity, and bury in a pit with freshly burnt lime all other rubbish which will decompose. Do not allow the accumulation of rubbish, especially when pests are hibernating for the Winter.

Do not overlook the question of growing immune species and varieties, when such are obtainable.

There must be a purpose in study, as a path through the woods; without that one wanders aimlessly.

Again, to study efficiently one must be Interested. Without that it is drudgery.

Another essential in study is lively Attention. A thing vividly impressed upon you stays with you. If your attention wanders, shut the book, do something else, and come back to it later.

But perhaps the most important element in study is Repetition. That is the secret of mastery. Never mind; if you have forgotten look it up again.

Another essential matter is to Understand all you read. Do not assume. Do not take things for granted. Challenge every fact. Use the dictionary, the encyclopedia, the teacher. Investigate. Ask questions. Know. Do not guess.

Study regularly whether you feel like it or not. The feeling will come in the grooves of habit. There can be no strong mental fibre without discipline.

And when the habit of study is formed, and pursued diligently, you will find it to be one of the most unalloyed joys of existence.

Most persons who have led any sort of intellectual life can truly say: "My happiest hours have been my hours of study."—Dr. Frank Crane.

Departments of Foreign Exchange and Book Reviews

A NEW LILY.

Within comparatively recent times, without taking into account the latest treasure here to be described, China has added five fine species, each representing one of the sections into which the genus is divided, to the none too lengthy list of lilies that make no considerable draft upon the cultivator's skill. All live—*L. Henryi*, *L. mirabile*, *L. regale*, *L. Thayeri* and *L. Willmottii*—are good garden plants, with strong constitutions, and all except the *mirabile*, a *Cardiocrinum*, naturally a leisurely lily, possess the inestimable advantage of coming rapidly to maturity from seed.

Now to this noble quintet is added one that in England has quickly attained the stature of six feet, one found by Mr. Farrer in the course of his first expedition to western China and known as *L. Farreri*, though christened by him the "Marble Martagon." It is easy to manage, has the priceless virtue of a tough constitution and sends up fine spikes laden with gigantic flowers and ultimately each rearing aloft a candelabrum of seed-pods. The foliage appears to be finer and more abundant than in most types of *L. longiflorum* and it approaches more in its whole style that of *L. regale*. Fortunately it produces seed in abundance.—*The Gardeners' Chronicle of London*.

A FEW OF THE NEWER CLEMATISES.

Clematis Meyeniana, a new hardy plant, valuable because of its early flowering is a sub-alpine evergreen from seed sent by Mr. Wilson from western China to Messrs. Veitch. Its white flowers are borne in profusion in axillary clusters. Its growth is said to be as much as 10 to 12 feet in one season and its flowering more profuse than that of *Cl. montana*. The Royal Horticultural Society of England has conferred upon it an Award of Merit.—*Garden Illustrated*.

Cl. Pavoliniana is a northern representative of the afore-mentioned, with its chief merits; but it has few-flowered inflorescences, often only three, and rarely more than seven flowers to each, whilst the sepals are distinctly longer than the stamens.—*The Gardeners' Chronicle of London*.

Cl. hybrida "Ville de Lyon," not an altogether new variety and in fact listed as long as five years ago by at least one American nursery firm, is now regarded by the writer here quoted as a possible point of departure for a new race, like the deservedly popular *Cl. Jackmani*. The two have one parent in common, *Cl. viticella*, the small-flowering Italian forest vine, which is unattractive in spite of its very profuse blooming and yet has the virtue of hardiness and of thriving where the large-flowering fail. But it seems to be the natural bond between the small-flowering species and those of large blooms. Nor does *Cl. Ville de Lyon* resemble at all its other parent *Cl. coccinea* with its small pitcher-shaped flowers and its slender stems that do not make really hard wood and which generally die down to the ground in winter. It surpasses even *Jackmani* in vigor, attains a height of 18 feet or more and bears dark carmine blossoms, of pleasing shade and symmetrical form and that stand forth handsomely from the green foliage, through the Summer and well into the Autumn. It makes pretty pictures growing up birches, firs or other small trees and shrubs and is most satisfactory for trellises. It is sure to do well and to grow luxuriantly if given the conditions favorable to all clematisses, heavy soil, but not soggy, and with roots protected from the hot sunshine.—*Zeitschrift fuer Garten-und Obstbau*.

[The last one should be pruned, rather severely, very late in the autumn. Will some one advise how the other two are best managed?]

BARBERRIES.

Berberis rubrostilla (The Red-Drop Barberry) is of graceful and very beautiful form and well deserves the honor of the First-Class Certificate awarded it by the Royal Horticultural Society. Of more or less erect carriage and freely branched in its upper parts it is of exceptional beauty late in the year when full of coral-red fruits which dangle on short foot-stalks from the under side of the branches. There is no over-crowding of the fruit clusters, but, instead, an easy distribution of them throughout the greater portion of the arching branches. It is a shapely, well-branched bush. The branches are thickly set with slender spines nearly an inch long. The yellow flowers of the Spring are followed by small clusters of rich red fruits, about four being borne together. The individual fruits are about half an inch long and similar in shape to those of *B. coccinea*,

which it is thought united with *B. Wilsoni* to produce it.—*Garden Illustrated*.

B. Wilsoni was discovered in western China in 1904 by E. H. Wilson, of the Arnold Arboretum. It is an elegant shrub of foliage semi-persistent, hardly ever more than a meter in height. The branches, more or less erect, are relatively slender, angular, of yellowish-brown color on the new shoots, grayish-brown when older, carrying spines always in threes, very pointed, from 1 to 1½ centimeters long. The leaves are fasciculated in groups of 4 to 6, obovate, almost linear, pointed at each end, not dentate, from 10 to 15 millimeters long and 3 or 4 broad, dark green above, somewhat glaucous beneath and somewhat hairy. The flowers are bright yellow, small, arranged in groups of from 2 to 6, abundant and appearing in May. The fruits are nearly globular or ovoid of 5 to 7 mm. by 4 to 5, of beautiful coral red, clinging from the end of October till severe Winter weather. It is hardy.—*Revue Horticole*.

B. subcaulata, raised by Mons. Maurice de Vilmorin from seed coming from Thibet in 1904, is more vigorous than the preceding, easily attaining 1½ m. in height, with larger branches and generally upright and of bright red color that turns into brownish-yellow, angular and almost fluted. The spines, measuring 1 to 2 mm. in length, are very pointed. The foliage is semipersistent, with leaves arranged in groups of 4 to 8, oblanceolate, terminating at the base in a point forming a petiole, entirely dentate or slightly dentate toward the summit, 2 to 3 cm. long and 5 to 8 mm. broad, clear green above and whitish beneath. The flowers, of pale yellow and in groups of 4 to 7, are very abundant in May. The fruits are generally globular, a little smaller than those of *B. Wilsoni*, and of bright red.—*Revue Horticole*.

B. japonica var. *Bealei*, referred to by W. R. Dykes, Secretary of the Royal Horticultural Society, in narrating a visit to a rock garden, as a "giant," is by him reported as having "perhaps the best scent of all," a fragrance like that of the little Scotch Briar, *Rosa spinosissima*.—*The Garden*.

[Will any reader of the CHRONICLE give more information concerning the plant last named; tell where can be obtained *B. Sargentiana*, described in the Cornell Bulletin 361 on page 374, describe and tell where can be obtained *B. Neuberti*, inform concerning the ultimate growth and size of *B. brevicaulelata*, *B. Gagnebainii* and *B. Juliana*, and add anything he may know about *B. Hakodate*. This last is by some nurserymen said to be similar to *B. Sieboldi*, and even identical with it, which is of the habit of *B. vulgaris*. But a letter just received from Professor Sargent states, "*B. Hakodate* was one of the plants sent in the '60's to S. B. Parsons at Flushing, Long Island. Its name, however, was never published and the correct name for the species is *B. Regeliana*. It has nothing to do with *B. Sieboldi*, but belongs to the *B. vulgaris* section. In foliage, flowers and Autumn coloring it is the handsomest Barberry of this section and one of the handsomest of all Barberries in cultivation. It does not at all look like *B. Thunbergii* or any forms of this species." Participation in a symposium with this serviceable genus as the topic, is invited.]

NOVELTIES OF UNUSUAL PROMISE.

Torch Lily Primula (*P. Littonia*), which has received a First Class Certificate at the Holland House Show, was found growing in open mountain meadows in the Yunnan at an altitude of 10000 feet. It prefers good loamy soil and partial shade. It dies down after flowering, but ripens plenty of seeds which germinate freely. It makes a beautiful tuft of grayish green leaves from which arises a scape 1 to 2 feet long. The bracts and calices are almost scarlet in color while the corolla is purple or pale lilac. A striking contrast is produced between the lilac purple of the open flower and the cap of scarlet or blood-red unopened buds at the top.—*The Garden*.

The Tittenhurst rhododendrons are extremely beautiful hybrids raised by Mr. T. H. Lowinsky of Tittenhurst, Sunninghill, Berks, England. They all were exhibited in pots recently at the exhibition of the Royal Horticultural Society which gave to one, Mrs. Tom Lowinsky, a unanimous award of merit. Its blossoms are large and wide-open, 5 inches across, with buds beautifully tinted pink and opening white. Others that received similar honor are *R. Anita*, shell-pink, *R. Donna Florenza*, rich deep rose, *R. "The Don,"* intense rosy scarlet that is very telling, *R. Don Ernesta*, extremely handsome rich rosy-scarlet, lighter than the last.—*The Garden*.

Cornus Nuttallii, "the noblest of the cornels," is another plant that has just received the rare First Class Certificate. It is a very handsome tree or shrub, that is particularly attractive,

partly because of its flowering so freely. The flower heads are fully 3 inches across, the creamy white bracts being the chief feature and surrounding a central boss of tiny flowers that are rosy until they expand, when they are yellowish. It was shown by J. Osborne, Drynham, Weybridge, England.—*The Gardeners' Chronicle of London*.

Hamamelis vernalis Sargentii (Sargent's Witchhazel), having for its habitat Missouri, Arkansas and Louisiana, where it is hardy, must certainly be the earliest shrub to flower in the year. And it is claimed to be as hardy as the other witchhazels. Its petals, of papyraceous nature, resist the January frost in France. It flowers profusely, even in the case of small plants, and so is well adapted to growing in pots. Its perfume is sweet and penetrating. The branches, cut in flower or in the bud, are excellent in association with the leaves of plants used in Winter ornamenting of houses.—*Revue Horticole*.

Siebold's Jasmine (*J. Sieboldianum*), from Japan, though not specifically distinct from *J. nudiflorum*, is a much finer and in every way superior plant. It is equally hardy and free-growing and produces larger flowers, more regular in outline, of much greater substance and more closely set on the plant.—*Gardening Illustrated*.

Tulip Inglescombe White is a great addition to the comparatively short list of white May-flowering tulips. It has a somewhat loose, cup-shaped, bloom with the tips of the petals reflexed.—*Gardening Illustrated*.

Trumpet Narcissus Flagstaff, a soft yellow, certainly has a future. It is exceedingly noble and refined, has splendid presence and firm texture.—*Garden Illustrated*.

Narcissus John Evelyn, a *bicolor incomparabilis*, of white perianth and yellow crown, has received an award of merit from the R. H. S.—*The Gardeners' Chronicle of London*.

Erica Darleyensis is a hardy heath that originated in the nurseries of James Smith and Son, Darley Dale, Derbyshire, England. It forms a dense spreading mass to a height of 1 to 2 feet and from November to April or May is covered with rosy-red flowers so that it makes an excellent informal edging to shrubby beds and borders. Unlike other heaths it does not need peat and grows almost as well, if not quite as well, in a sandy loam with which a fair amount of leaf mold has been incorporated. Cuttings root readily in late Summer and early Autumn.—*The Gardeners' Chronicle*.

Moraea iridioides Johnsoni is the loveliest of all the *Moraeas*. Its blossoms are not only double the size and far more beautifully colored than those of the type, but they persist also about 4 days in semi-shade and only a little shorter time in full sunshine. The flowers, of creamy-white, blotched with yellow and with the central standard of a rich shade of violet and feathered at the base with crimson-brown markings, are of singular beauty and hues quite harmonious.—*The Gardeners' Chronicle*.

Saxifraga Irvingi, named to compliment Mr. Walter Irving, the head of the hardy plant department at Kew, where it originated, appeals by dainty coloring and wondrous flower freedom, to all lovers of choice alpine. Only an inch tall it almost hides its spiny tufts with flowers large for its own diminutive stature, of delicate shell-pink, deeper apparently at the base where the color from the ovary is reflected, and finishes almost white. After 2 years from the cutting the natural density of growth precludes full development of the rosettes. In the rock gully it should be given loam, grit and pulverized rock in equal proportions; a window ledge or alpine house reveals its charms best.—*Gardening Illustrated*.

Viola calcarata, well named the "Pansy of the Alps," is a lovely plant that forms tufts of leafy stems about 3 inches high and which bear large violet-purple flowers, each with a long spur. It is easily grown in the rock garden, in half shady sites or even in full sunshine, providing that it has sufficient moisture at the roots. It should be planted in very gritty soil with thorough drainage. Cuttings inserted in Summer readily strike root; but it may be raised from seeds sown as soon as they are ripe. There is a clear yellow form also.—*The Gardeners' Chronicle of London*.

Haldsteinia trifolia, with remarkably pretty, leathery and shiny green leaves and sprays of golden flowers over a considerable time of the Summer, is probably the best garden plant of the genus. It is not too rampant easily to be kept within bounds as a carpet. Above a retaining wall it is particularly delightful.—*The Gardeners' Chronicle of London*.

SUNDRY ITEMS OF INTEREST.

The Classification of Tulips. "It is probably little known outside of England and Holland that an Anglo-Dutch committee has revised the classification of garden tulips in 1914-15 by studying for two seasons the flowering of tulips in the garden of the Royal Horticultural Society of London, where the English and Dutch horticulturalists have planted the bulbs of more than 1,500 different named varieties and that they have verified all by fixing the exact name for each variety. A very instructive report of 164 pages, ornamented with numerous figures and containing photographs of the bases of different flowers to serve for their classification, was published in 1917 under the auspices of the Society.

In recommending the study and consulting of this report to all who are interested in tulips I give myself the honor of giving here the outline of the classification adopted by the committee.

I. Early Varieties: A. Duc van Thol, singles; B. singles; C. doubles.

II. Late Varieties: A. Cottage Tulips; B. Self-colored Mother Tulips (Breeders); 1. Dutch (rose-violet-varied); 2. English (rose-violet-varied); 3. Darwins; C. Varieties rectified (with striped flowers); 1. Dutch (rose-violet-varied); 2. English (rose-violet-varied); 3. Rembrandt (rose-violet); 4. Cottage Tulips rectified (rose-violet-varied). D. Parrot Tulips; E. doubles.

III. Botanical species.—*Ernest Krelage, in Revue Horticole*. Some copies of the classification of tulips made by the committee of the R. H. S. in 1914-1915 and containing the lists of the tulips of each group according to color can still be obtained from R. Dykes, Secretary, Vincent Square, London, S. W., at 5s. each.—*Revue Horticole*.

As to "Daffodils that take the winds of March with beauty," it is to be borne in mind that Shakespeare wrote under the old calendar when the year was ten days behind. His month of March began on what is now March 11 and ended on what is now April 10. So a third of the month was really April. Then, too, he probably had in mind, not our garden daffodils, but the wild Lent Lily. This was much more abundant in the sixteenth century, before modern civilization had ousted it from its haunts, especially near towns. Even by our modern reckoning it is commonly in full bloom in March.—*The Garden*.

Rhododendron Loderi, in the opinion of many the finest flowering shrub hardy in northern climes, is again given prominence by the death of its originator, Sir Edmund Loder, Bart., of Leonardslee, Sussex, England. This fine plant, which produces massive and well-built trusses of sometimes over 30 inches in circumference, the individual flowers of which are occasionally 6½ inches across, is only one of this plant-lover's distinctions. In his garden are over 350 species and varieties of conifers, a collection surpassing anything else of its kind in the country.—*The Garden*.

The English Rock Garden, Reginald Farrer's latest book, is a notable work indeed, in spite of some inaccuracies already detected by the reviewer and in spite of its not having a greatly needed index. On over 1,000 pages it describes plants, the number of which runs up into 4 figures. "One can only be amazed at the industry and ability of the author which enabled him to complete so stupendous a task within the limits of an ordinary lifetime."—*Irish Gardening*.

Prunus cerasifera Pissardo or *P. c. atropurpurea* (Purple-leaved Plum), of foliage that in its young-growth stage is tender ruby-red, changing later to claret, finally to dull, heavy purple, can be trained and really is best pruned freely, for this does not lessen the crop of flowers, but rather increases it.—*The Gardeners' Chronicle of London*.

Magnolia stellata (White Starry Magnolia), planted against the wall of a house facing west by south, flowers in profusion. To confine it, it may be cut back hard as soon as it is done flowering.—*The Garden*.

Like most magnolias it likes a rather heavy soil, but as it is so hardy and easy to grow it flourishes even in a light and peaty soil.—*Garden Illustrated*.

Verbena Carlesi, as regards fragrance has not a rival. It scents the air for yards, when even a quite small plant. But *Osmanthus Delavayi*, hardy in a climate like that of southern England, is not fragrant when grown in the open. Under glass it perfumes the air much more.—*The Garden*.

Spiraea arguta is one of the best dozen April-flowering shrubs.

[This confirms the opinion so emphatically expressed by the lamented C. S. Harrison.] It makes a splendid background for tulips.—*The Gardener*.

The eelworm disease of narcissi may exist when the plants look perfectly healthy with regard to quantity of foliage made; but close examination will reveal small, pale colored and swollen areas which stand out in contrast to the deeper green of the rest of the leaf. But as pale spots not due to the disease sometimes occur it is best to draw the leaf between the thumb and the finger. Only if a decided swelling is felt is the leaf affected by the eelworm. Dead cells will be indicated by the brown color found by cutting the spot across and letting the microscope discover the worm and the eggs. The disease is most marked in the foliage of broad-leaved varieties like Emperor and Victoria and not so pronounced in poetic varieties, and hybrids. In Holland men are employed to examine the plants carefully and to take out in each case about a cubic foot of earth, even at the sacrifice of adjoining bulbs not affected. No remedy has yet been discovered.—*The Gardeners' Chronicle of London*.

To prevent mildew of strawberries spray vigorously and thoroughly, as soon as the new growth begins, with lime, sulphur and soft soap.—*The Gardeners' Chronicle of London*. For the successful culture of strawberries the late Marshall P. Wilder is reported to have recommended, "First, plenty of water; secondly, plenty of water; thirdly, plenty of water."—*Gardening Illustrated*.

Every annual is better transplanted,—except Mignonette, Poppies and Sweet Peas. The shift, with the greater majority of the annuals, leads to stockier and more flowery clumps. Sown out of doors, even, they should be at least once transplanted.—*Gardening Illustrated*.

[*Vie à la Campagne* for April contains an article strongly giving similar advice for the handling of tomatoes and similar fruiting plants.]

An international horticultural exposition is being held at Antwerp, to last until the end of October, in connection with the Olympic Games. The Parc de Rossignols has been transformed into an immense garden and a Floral Palace constructed. The program allots different periods of time for different plants, according to season, and for the various appurtenances of horticulture in one form or another. The prizes, consisting of objects of art and of medals, or cash at option, in value from two dollars up to sixty, are many. The King and the Queen of Belgium are offering special prizes. The exposition was to be opened May 1 by the King in person.—*Revue Horticole*.

In the new Republic of Tschechoslovakia, at the University of Prague, horticulture and landscape architecture have just been installed in the curriculum, a large sum of money has been appropriated by the state to restore at the castle the famous park and gardens called "Hirschgraben" and at the foot of the historic White Mountain near Prague, where 300 years ago the Tschechs lost their independence, a garden city for 35,000 inhabitants is planned. The state's invalids and discharged soldiers are to have opportunity, upon most advantageous terms, to acquire homes and gardens among ideal civic surroundings. The construction of this "Masaryk's Garden City" has already been begun. The state ministry of agriculture has established a national fruit garden under the direction of a celebrated pomologist.—*Zeitschrift fuer Garten- und Obstbau*.

[Next month will be presented a general survey of conditions horticultural that have been obtaining since the war in the devastated countries, and in Germany the restorations that have been accomplished and, from the point of view of the inhabitants themselves, the plans and hopes for the future.]

The partial sterilization of soil to increase productiveness is receiving increased attention. Soil organisms helpful to the crop are on the whole more resistant to adverse circumstances than are organisms which are not helpful and consequently any treatment that kills some but not all of the organisms improves the soil as a medium for plant growth. Vergil, in his Georgics, refers to heating the soil to increase its productiveness and ancient writers in India mention it. Heating is more beneficial than a more direct chemical treatment because it not only accomplishes partial sterilization but also effects a certain amount of decomposition. But when it is not practicable to apply heat, as in the form of steam under an inverted tray, use may be made of carbon disulphide, at the rate of from ½ oz. to even 8 oz. a square yard, or of carbolic acid or cresylic acid.—*South African Country Life* quoting from *Country Life of England*.

All quotations from the magazines are abridgments, except when in quotation marks. Only words within square brackets express the reviewer's ideas.

Potato scab is avoided by setting the pieces of the tuber on fresh or slightly decayed grass cuttings, a wheelbarrowful being enough for about 8 square yards. The grass takes the place of manure also. Of course it would be well to add sulphate of ammonia, sulphate of potash and superphosphate of lime.—*The Gardeners' Chronicle of London*.

Stocks upon which to graft buds of fruit trees should always be grown from the largest and most vigorous fruits possible, according to Charles C. Crandell in Bulletin 211 of the Illinois Agricultural Experiment Station. But it appears to be a matter of indifference whether the buds chosen be large or small or whether they be chosen from one part of the tree or another.—*The Gardeners' Chronicle of London*.

BOOK REVIEW DEPARTMENT

The Nursery Manual. By L. H. Bailey; 24mo., cloth; XI + 456 pages, with XII plates and 226 cuts; the Macmillan Company, New York.

Before beginning the reading of the book, in order to test its completeness and general satisfactoriness, it was consulted concerning the propagation of such rather unusual subjects as Nut Trees, Dwarf Fruit Trees, "Pedigree" Plants, *Cryptomeria*, *Leucothoe* and *Pieris*. In every instance all the information that could be desired was readily found, with not even one partial exception. In the treatment of the propagation of dwarf fruit trees, even, is told, with perhaps sufficient detail, how the dwarfing roots are best obtained and managed. But a glance through the index and the Nursery List, which occupies 222 pages, afforded conviction that the work gives satisfactory treatment to many, many subjects more unusual than those enumerated above. In fact, no subject that should be dealt with by a book of the name seems to have been omitted. The general excellency is exactly what might be expected to be found in a book emanating from the man who combines almost incomprehensibly great knowledge of horticulture in all its phases with pre-eminent literary ability and pedagogic skill.

His book of this name has been greatly appreciated since its first appearance nearly thirty years ago, as is attested by the fact that the demand for it has exhausted twenty-one editions. The present edition, coming as it does when the importation of practically all nursery stock has ceased and America must grow her own, even the dwarfed evergreen trees and the broad-leaved evergreens for which great pains and patience are requisite, is an invaluable contribution to the public as well as to nurserymen in particular. It is an edition that has been completely revised. In recompiling the Nursery List, which, following the chapters that are devoted to Classes and Kinds of Propagation and Certain Elements in Nursery Practice—a most interesting chapter for general reading—gives in alphabetical arrangement concise and yet adequate directions for propagating every plant that conceivably could be inquired about, the editor has had the advantage of many expert advisors, men all eminently worthy, because of practical experience combined with so much learning, to have part in a work so important.

The mechanical execution of this admirable work seems to be beyond criticism.

The Arnold Arboretum's Bulletins of Popular Information appear at brief intervals during the Spring, Summer and Autumn when the results of direct observation and study can be given out fresh. Each of the four numbers that have appeared this year is interesting and instructive. These four numbers alone would seem to be worth to any horticulturist or student of plant-life the price of the dollar for which the bulletins are obtained each year. They give, as they profess to do, popular information. The presentation is scholarly; but it is not, as might be expected from such a source, the presentation of facts about new and rare plants in which the average reader might have only the interest arising from curiosity, if any interest at all. Rather is it the purpose to bring to attention the excellence of the more desirable and serviceable plants, to guide in the control of them successfully and to give general information of use to the horticulturist, the planter, the gardener and the designer of gardens and parks. In determining the hardness and general adaptability of plants brought from abroad or from one part of the country to another and of those arising from sports or from hybridized seeds the work of the Arboretum is of the greatest value and importance, largely because of its geographical location. This year's first number, for example, contains a valuable as well as most interesting discussion of the effects of the severe Winter just passed. In connection it is here not out of place to suggest that greater efforts might be made toward devising convenient and economical preventative of the ravages of field mice and other rodents so often destructive of young trees.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK.

L. P. JENSEN, *President*, St. Louis, Mo.
D. L. MACKINTOSH, *Vice-President*, Stillwater, Minn.

THOMAS W. HEAD, *Treasurer*, Lake Forest, Ill.
M. C. EBEL, *Secretary*, Madison, N. J.

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GARDENERS' ANNUAL CONVENTION.

The date for the annual convention of the National Association of Gardeners has been set for September 14, 15, 16, at St. Louis.

The Marquette Hotel has been selected as the headquarters and meeting place of the convention, and the following committee is in charge of the local arrangements: Program, George H. Pring; Reception, Hugo Schaff; Entertainment, Ernst Strehle; Decoration, John Moritz; Publicity, H. C. Irish.

This year's convention of the national association will be the most important in its history, as several matters which will have much bearing on the future of the gardening profession, will be presented to the convention for consideration. The subject of examination and classification for gardeners, which was referred by the Cleveland convention to the coming convention, will be submitted for final action.

As the convention of the American Association of Park Superintendents will be held in Louisville on September 9, 10, 11, a good attendance is looked for at our convention, as many members are affiliated with the two associations. The dates have been arranged so that members may attend both meetings.

President Jensen writes that the local members of the association are planning to make the 1920 convention a memorable one in every respect.

THE GARDENERS' CONFERENCE AT BOSTON.

There was a well-attended gathering of gardeners at the conference, held on Thursday evening, May 6, in Horticultural Hall, under the auspices of the Boston members of the National Association of Gardeners. Robert Cameron acted as chairman of the meeting.

The discussion centered chiefly on the labor problem and how it affects the country estates, and on the inability to secure skilled help. It was pointed out that in many instances the ordinary laborer is receiving more compensation for his eight or nine hours a day work on the estates than the superintendent who employs him; while it is almost impossible to secure assistant gardeners, as they have been attracted to other industries where the compensation is better and the hours of work less.

How to interest the young men in the profession of gardening was a much debated question with no practical solution forthcoming. The secretary of the National Association of Gardeners who was present, reported that the committee which has this matter in hand, is about to present the advantages that the gardening profession offers to young men, to the educational sources of the country to have them bring the opportunity to the attention of the boys about to leave school, to whom the call of the great outdoors may be more enticing than the office or the shop. Some of the gardeners told of the young men who wanted to train for the gardening profession. While some of them manifested keen interest in the work, others, finding it too arduous, soon dropped out. This, however, holds true with any vocation.

W. N. Craig was asked to tell of his attendance at the annual meeting of the Garden Club of America, which he addressed in New York City last March. He reported that he found the ladies very much interested in the welfare of the professional gardeners, and that they are in sympathy with his viewpoint on the subject. Mr. Craig warned that he found the members of the Garden Club unusually well informed on gardening and on the common and the rare inhabitants of the garden.

Mr. Cameron related his experience with the farmerettes, which are regularly employed on the estate of which he is in

charge. He said that while at first he did not favor the idea, he has been compelled to change his views, for the young women take great interest in their work and are steady workers. Mr. Cameron recommended that where there is help shortage and it is possible to secure farmerettes, they be given a fair trial.

A lively discussion on what constitutes proper compensation for employees on country estates was carried on between Messrs. D. Finlayson, J. Methven, A. K. Rogers, W. N. Craig, J. Donald, and revealed that conditions are not alike on any two estates; that country estates as a rule are self-governed. A suggestion that a uniform schedule might be of some advantage was promptly tabled, as having a tendency towards unionism, to which the professional gardener, as indicated by the attitude of those present, is decidedly opposed.

The resolution of the Massachusetts Horticultural Society to have a meeting of all horticultural organizations at an early date to adopt some plan of action to bring about a modification of Quarantine Bill No. 37 was endorsed by the conference.

SUSTAINING MEMBERS.

Mr. and Mrs. J. Pierpont Morgan, Glen Cove, L. I. (Angus MacGregor, superintendent); W. R. Coe, Oyster Bay, L. I. (Thomas Proctor, superintendent); James B. Duke, Somerville, N. J. (Jas. Dimock, gardener); John L. Severance, Cleveland, O. (Arthur Brown, gardener); Mrs. Samuel Sloan, Garrison, N. Y. (Robert Miller, superintendent); F. M. Sackett, Louisville, Ky. (P. Bovington, superintendent); Paul D. Cravath, Locust Valley, L. I. (Auguste Fournier, superintendent); E. H. Inman, Atlanta, Ga. (William Atkinson, gardener); H. E. Converse, Marion, Mass. (David F. Rey, superintendent); W. E. Kimball, Glen Cove, L. I. (J. H. Frampton, gardener); E. F. Price, Port Chester, N. Y. (Joseph Goatley, gardener); Mrs. C. G. Rice, Ipswich, Mass. (Stewart A. Forbes, gardener); A. C. Loring, Mound, Minn. (George H. Instone, superintendent); Mrs. W. Stursberg, Great Neck, L. I. (Frank Wallington, gardener); have become sustaining members of the association.

NEW MEMBERS.

The following new members have been recently added to our membership list: Charles Milburn, Suffern, N. Y.; Andrew Andersen, Manhasset, L. I.; Hans Peters, Yonkers, N. Y.; Robert Watson, Wellesley, Mass.; Walter H. Golby, Jamaica Plains, Mass.; William Sutherland, Hyde Park, Mass.; H. L. Crane, West End, N. J.; John H. Koster, Stamford, Conn.; Auguste Fournier, Locust Valley, L. I.; Gordon P. Stewart, Waltham, Mass.; K. A. Hedlund, Grosse Pointe Shores, Mich.; John Morris, Hyde Park, Mass.; James Lawson, Hyde Park, Mass.; Henry F. W. Rossiter, Elberon, N. J.; Peter Smith, Sharon, Conn.; Walter Trigalet, Mamaroneck, N. Y.; Donald Luke, New York, N. Y.; Andrew McKendry, Westbury, L. I.; Robert Main, Tarrytown, N. Y.; John T. Leahy, Harrison, N. J.; Anthony C. Ruzicka, Somerville, N. J.; Frank L. Clayton, Brookville, L. I.; John Fogarty, New York, N. Y.; Charles Dobson, Stamford, Conn.; Victor Olsen, New York, N. Y.; Maynard F. Douglas, So. Eliot, Me.

CAMPAIGN FUND TO INTEREST YOUNG MEN.

Previously acknowledged \$120.00
James B. Duke, Somerville, N. J. 25.00
Lord & Burnham Co., Irvington, N. Y. 100.00

\$245.00

Before the campaign can be commenced in earnest the association will have to have sufficient funds to carry out its plan

effectively. The country estate owners as well as the commercial horticultural interests are vitally interested in the question of attracting young men to the gardening profession, and support for the movement should come from them as well as from the gardeners' association. Our members are asked to present this important subject both to their employers and to the trade interests and their financial support enlisted. This will enable the association to advertise the campaign properly and to issue instructive literature, setting forth the advantages which the profession of gardening offers as compared with those of other vocations. Quick action is necessary for success.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received towards the Service Bureau Publicity Fund up to June 1st:

Previously acknowledged	\$1,256.00
John Thompson, Cranford, N. J.	2.00
James Johnston, Oyster Bay, N. Y.	2.00
Carl Petersen, New Rochelle, N. Y.	3.00
George Ferguson, Manhasset, L. I.	5.00
Richard Vince, Shrewsbury, Mass.	2.00
William Warburton, Fort Wayne, Ind. (ad)	5.00
J. H. Brunger, Riverdale-on-Hudson, N. Y. (ad)	2.00
William Smith, Newport, R. I.	2.00
William Tait, Bedford Hills, N. Y.	5.00
Henry Gibson, Brookville, L. I.	25.00
E. B. Palmer, Roslyn, L. I.	15.00

\$1,324.00

AMONG THE GARDENERS

E. B. Palmer, recently at Mahwah, N. J., secured the position of superintendent on the Childs Frick estate, Roslyn, L. I., succeeding Alexander Michie.

J. C. Armstrong, formerly gardener on the late ex-Gov. Franklin Murphy estate, Franklin Farms, Mendham, N. J., secured the position of superintendent on the estate of F. M. Sackett, Louisville, Ky.

Philip Bovington, who for the past four years has been superintendent on the estate of F. M. Sackett, has accepted the position of superintendent on the estate of A. R. Erskine, Twickenham Park, South Bend, Ind.

A. Martini, who has been superintendent for the past number of years on the F. D. Countiss estate, Lake Geneva, Wis., has accepted a similar position with Mrs. G. B. Douglas, Cedar Rapids, Iowa.

Anton Bauer for many years at Deal N. J., has accepted the position of gardener on the estate of S. G. Mortimer, Tuxedo Park, N. Y.

Donald Luke, for the last six years gardener on the estate of Alexander MacKenzie, Glen Spey, N. Y., secured a similar position on the estate of R. H. Ripley, Oyster Bay, L. I.

George Hewitt, recently of Lenox, Mass., accepted the position of gardener on the J. H. Topping estate, Greenwich, Conn.

John I. Foxcroft secured the position of gardener on the estate of Mrs. Stoeckel, Norfolk, Conn.

John Thompson accepted the position of gardener to E. I. Goodrich, Cranford, N. J.

John Alexander has secured the position of superintendent on the Young estate, Glen Cove, L. I.

Richard Vince has accepted the position of gardener on the C. H. Hutchins estate, Shrewsbury, Mass., succeeding Walter S.

Wherein The Grocer's Boy Taught Us A Business Lesson

When I was a youngster, my chum, Nick, worked in his Dad's little village store.

One winter we had a whale of a snowstorm.

Nobody "got to town" for a couple of days.

But Nick got to most of his customers within a couple of miles, by horseback.

The urgent things that they were out of were delivered that same day on horseback—with a big basket "tied on behind."

They rode right up to people's windows and handed things in.

The competitors waited until the "roads were broken," before they started out.

They called Nick a "crazy young fool."

And in a way he was. But he gave service **under stress** to his customers, that made them loyal boosters.

What has all this "small town stuff" got to do with you and me?

Just this.

You know how difficult shipments have been and still are.

When the railroad strike was on, it did seem as if we were just about snowed in.

When things were at their worst, I got thinking of Nick's way of tackling the worst things.

So we just hove to, and kept our trucks running day and night, and did some seemingly impossible things.

And now we want to heartily thank both our old and new customers for the fine spirit you showed towards all our efforts.

We have a very warm appreciation for your patient, generous point of view.

R. Roehrs

Julius Roehrs Co
At The Sign of The Tree
Box 20 Rutherford N.J.

Dack, who recently resigned this place.

Arthur Adams accepted the position of gardener at Providence Convent, Saint Mary-of-the-Woods, Indiana.

Alfred Townsend for the last four years gardener to S. G. Mortimer, Tuxedo Park, N. Y., has secured the position of gardener on the Clayburgh estate, Mt. Kisco, N. Y.

W. R. Seymour accepted the position of gardener on the estate of Henry Young, Bernardsville, N. J.

Frank Cataldo secured the position of gardener to Mrs. R. W. Sears, Brookline, Mass.

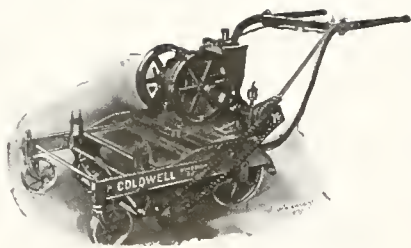
John T. Leahy accepted the position of gardener on the A. E. Mitchell estate, Stamford, Conn.

LOCAL SOCIETIES

ST. LOUIS ASSN. OF GARDENERS.

Upon invitation of the Weber & Sons Nurserymen of Nursery, Mo., the club held its first Summer meeting at the aforesaid grounds on May 2nd. Despite the inclement weather forty members attended. Unfortunately the weather prevented the inspection of the grounds, so the time was devoted to the greenhouses and cold-storage plant.

The meeting was called to order by L. P. Jensen (our local and national president)



Does the Work of Four Men

This Coldwell Motor Lawn Mower and Roller (walk type) pays for itself many times in the wages it saves. Does four men's work. Geared to four miles an hour—easily operated. Long wear.

Coldwell's Combination Motor Lawn Mower and Roller Model J—the latest ride type machine. Weighs 1100 pounds on the drive rollers, 40-inch cut. Useful on parks, estates and country clubs. Write for complete catalog of the Coldwell line, including Gang Mowers, Horse and Hand Lawn Mowers.

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in the spacious garage. After committee reports were presented the chairman introduced the club's entomologist, Herman Schwartz, who lectured on "Insects Useful and Depreciating to Plant Life." Some essential factors were explained enabling the gardener to differentiate between various kinds of insect life, i. e. *Insects*, those having separate head, thorax and abdomen, always possessing six legs attached to the thorax, the honey-bee being the most intelligent. *Beetles*, Possessing hard protective wing coverings. Mouth parts from side to side enabling them to chew or bite their food. *Bugs*, Possessing a sucking mouth part, inserting their proboscis into the leaves, drawing forth or sucking their food. The speaker answered some interesting questions brought out in the discussion, especially in reference to the life cycle of the parasitic insects. A. F. Satterthwait, of the Department of Agriculture, spoke on the relative value of the birds in controlling insects in general.

After adjournment the members were the guests of Mr. Weber at a sumptuous lunch.
G. H. PRING, Cor. Sec.

NEW LONDON (CONN.) HORT. SOCIETY.

This society held its regular monthly meeting on May 13th.

After the usual business routine, President Silva Tiens introduced Mr. Felling, State Forester, who gave an illustrated lecture on the State Parks and Forests. The lecturer told of the work being done by the state commission in providing recreation spaces and buying up shore land for the public good throughout the State.



The Superintendent Says:

"Madame and the family can now have the flowers they like—and as many as they like—as often as they like. And the best part of it all is that there is no trouble for me. Our V-Bar Greenhouse is easier to take care of than any other I have ever managed."

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Inexpensive. Easy to master. Earn while you learn. Diploma awarded. Special proposition to HOME OWNERS and Plan for beautifying your property.

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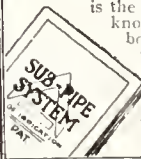
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is the greatest producer of vegetation known. Write for descriptive booklet and prices. Act NOW to get full benefits THIS SEASON. If interested in our proposition to demonstrators, so indicate.

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After discussion among the members on the work, a rising vote of thanks was given the speaker. One new member was admitted to membership.

STANLEY JORDAN, Cor. Sec.

MONMOUTH COUNTY (N. J.) HORT. SOCIETY.

The regular monthly meeting was held, with President Waite in the chair and a good attendance. Also excellent exhibits. After the regular business was dispensed with discussion came up in regards to holding a June show such as strawberries, sweet peas, roses, vegetables, etc.. Of course, the help question in this section is a bit of a handicap. However, we have decided to hold same towards the end of June. To all appearance things will be a bit late this season on account of the backward season; also roses seem to be breaking weak after the arctic Winter they have gone through. Let us hope for more seasonable weather then, perhaps, everything will surprise us.

WM. TURNER, Cor. Sec.

NASSAU COUNTY HORT. SOCIETY

The regular monthly meeting was held on Wednesday, May 12. President Twigg occupied the chair. Messrs. Dungee, Donovan, Turkington, Lutton and Van Givoren were elected to active membership and two petitions for active membership were received.

An interesting feature of the meeting was an open discussion on the damage done to trees and shrubs last Winter. Mr. Reed was a visitor from New York and he gave us a short talk.

ARTHUR COOK, Cor. Sec.

TUXEDO HORT. SOCIETY.

A regular monthly meeting was held on May 12. An excellent and instructive paper read by Thos. Lyons, gardener to Samuel Wagstaff, Esq., on the construction, management and general care of the conservatory brought out considerable discussion and was favorably commented on. John Livingston, manager of the W. P. Hamilton place at Sterlington was elected to active membership.

Final arrangements were made for the annual ball to be held on Wednesday evening, May 26.

JAS. DAVIDSON, Sec.

TARRYTOWN HORT. SOCIETY.

The regular monthly meeting was held on May 19. An application was received from Andrew Strachan of Yonkers, N. Y., to become an active member of the society. A committee was appointed in reference to holding the annual Summer outing, to report at the June meeting. The society will hold a June exhibition at their regular meeting. Memorandum of the prizes will be mailed to all members of the society.

The Fall exhibition of the society will be held in Music Hall, Tarrytown, on November 3, 4 and 5, 1920.

CHAS. J. WOOD, Reporting Sec.

NORTH SHORE (ILL.) HORT. SOCIETY.

The above society held its regular monthly meeting May 10. President Bollinger brought up for discussion the lifting of the embargo on plants, etc., of foreign origin, pointing out that some varieties such as Standard Roses and Azaleas cannot be grown in this country owing to climatic conditions. Some of the members were in favor while others held different views. The matter was left over until a proper resolution could be drawn

PLANT SUCCESSION CROPS FOR FALL AND WINTER USE

Succession crops are most important, since they provide fresh vegetables for fall and winter use. A cellar full of stored vegetables, of just the right size, is not only a good investment but also a treat. Stored vegetables are healthier than canned vegetables.

JUNE IS THE MONTH TO PLANT

Bush Beans, Lima Beans, Beets, Brussels Sprouts, Cabbage, Carrots, Cauliflower, Celery, Sweet Corn, Cucumbers, Endive, Kale, Kohl-Rabi, Musk Melon, Parsley, Squash, Summer-Radish, and Swiss Chard.

Write for a free copy of "Burpee's Seeds for Summer Sowing" and the Burpee Cultural Leaflet on "Summer Gardening."

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Our famous Interchangeable No. 14.
For Wren or Bluebird.

Price \$2 and post charges; weight
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Our famous 3 for \$5.00 Bird Houses;
weight 10 lbs.

Crescent Sparrow Trap, none better,
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SOLD BY SEEDMEN IN CANADA FOR OVER THIRTY YEARS



Hammond's Slug Shot
Grandfather used it for potato
bugs. Father uses it. Mother
uses it on her roses.
This year I am using it
in my garden.

"HAMMOND'S SLUG SHOT"

Used from Ocean to Ocean

A light, composite, fine powder, easily distributed
either by duster, bellows, or in water by spraying.
Thoroughly reliable in killing Currant Worms, Potato
Bugs, Cabbage Worms, Lice, Slugs, Sow Bugs, etc.,
and it is also strongly impregnated with fungicides.
Put up in Popular Packages at Popular Prices.
Sold by Seed Dealers and Merchants.



HAMMOND'S PAINT AND SLUG SHOT WORKS, BEACON, NEW YORK.

up and presented at our next meeting and put to a vote.

Mr. O. Carll, head gardener from Lincoln Park, is expected to talk at our next meeting. Two new members were enrolled.

J. R. CLARKE, Cor. Sec.

WESTCHESTER AND FAIRFIELD HORT. SOCIETY.

The regular monthly meeting of the above society was held in Greenwich, Conn., May 14. There was a good attendance with President Andrews in the chair. Two honorary members were elected and 3 proposals for membership received. Various subjects were discussed, but the principal speaker of the evening was M. C. Ebel, secretary of the National Association of Gardeners. For two hours he kept the members' attention describing the workings of the association's Service Bureau, and giving hints about the betterment of the gardener's position. Mr. Ebel received a rising vote of thanks. A telegram was read from Charles Gatty regretting that he was unable to be present, but advised the boys to keep on potting. There was a fine display of plants, flowers and vegetables.

JACK CONROY, Cor. Sec.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Here and There

EFFECT OF LIGHT ON PLANTS.

It is said that greenhouse experiments conducted by the Bureau of Plant Industry of the U. S. Department of Agriculture have proved that the flowering and fruiting period of practically any plant can be made to take place at any time of the year by darkening the greenhouse in the morning and evening if the day is too long, or by lengthening the day by artificial light if the day is too short. Spring flowers and Spring crops, it is asserted, happen to be Spring flowers and Spring crops because the days at the season of their flowering and fruiting have the proper number of hours of daylight. Experiments were conducted with a large variety of plants. By employing dark chambers, the scientists shortened or lengthened the life cycle of plants and forced some of them to complete two cycles in one season. Violets, which naturally bloom only during the comparatively short days of Spring, when covered with light-proof boxes for a time were made to bloom again during the Summer. Temperature appeared to exert no influence in the tests. The relative unimportance of temperature was demonstrated in the fact that plants kept in the dark for a part of the day underwent in Midsummer the changes that in nature come in the Fall, and that heretofore have been attributed to lower temperatures. This was true even when the dark houses registered a higher temperature than the outside atmosphere. Iris kept in artificial light for eighteen hours a day bloomed in two months, while others in the same temperature, but without artificial extension of the day, required months longer. The new principle is said to explain why plants grow most luxuriously near the northern limit of

King

GREENHOUSES

Modern Houses of the Better Type

Just look at one of these modern houses and you will be surprised at the attention given every detail of construction.

You will find for instance that the framing members are very strong yet so constructed that they cast very little shade. That's why Kings have the reputation of being such splendid growing houses.

Write us for the name of some gardeners near you who have King houses. Ask them or go and see the house. That will tell you the entire story.

King Construction Company
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their range, where the long day permits maximum vegetative growth before the short day intervenes to start reproduction.



QUALITY RED POTS

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Famous "Moss-Artec" Ware includes Azalea Pots, Fern Dishes, Hanging Baskets, Lawn Vases, etc. Write for catalogue and price list.

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Subscription price \$1 per year—three years for \$2. Grow flowers and thus help brighten the pathway and cheer the hearts of many whose nerves are shattered by the horrors of war.

Mention the "Gardeners' Chronicle" and ask for a sample copy.

MADISON COOPER, Publisher
CALCIUM, N. Y.

WANTED AT ONCE—First class, married vegetable gardener on private estate; good wages, steady position, best of references required. D. G. A., Box 141, Greenwich, Conn.

BOX-BUSHES

four of large size. Diameter at base eight to nine feet. Price, \$75 each.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of "Gardeners' Chronicle of America," published monthly at New York, N. Y., for April 1, 1920, State of New York 1 ss., County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared M. C. Ebel, who, having been duly sworn according to law, deposes and says that he is the editor of the "Gardeners' Chronicle of America" and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, managing editor, and business manager are: Publisher, The Chronicle Press, Inc., 286 Fifth Ave., New York, N. Y. Editor, M. C. Ebel, 286 Fifth Ave., New York. Managing Editor, M. C. Ebel, 286 Fifth Ave., New York. Business Manager, M. C. Ebel, 286 Fifth Ave., New York.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state). There are no bondholders, mortgagees or other security holders.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other persons, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Sworn to and subscribed before me this 5th day of April, 1920.

M. C. EBEL, Editor.

[Seal] C. I. KELJER,
My commission expires March 30, 1921.)

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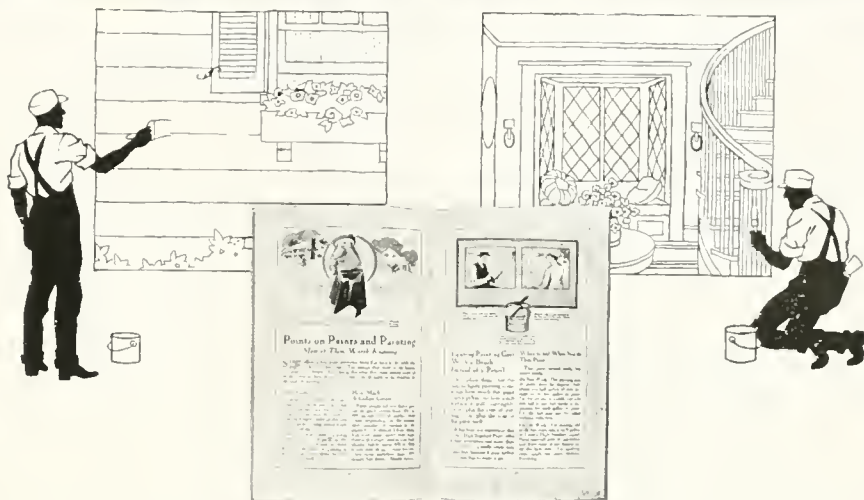
on about us, seen and unseen by human eyes; it is not alone the leaf beetles and their larvae, the defoliating lepidopterous caterpillars and the sucking bugs that play havoc if unchecked. At the roots, in the stems, within the blossoms and the fruit, others are at work that cannot so easily be reached.—*American Suburbs*.

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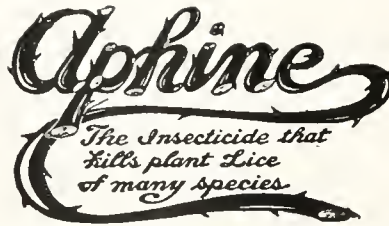
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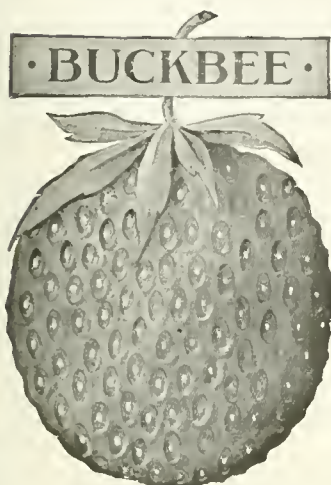
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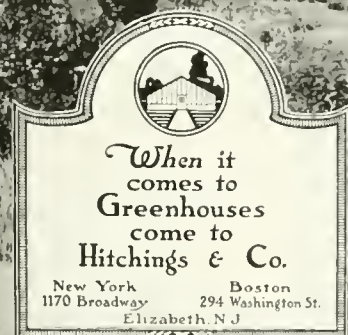
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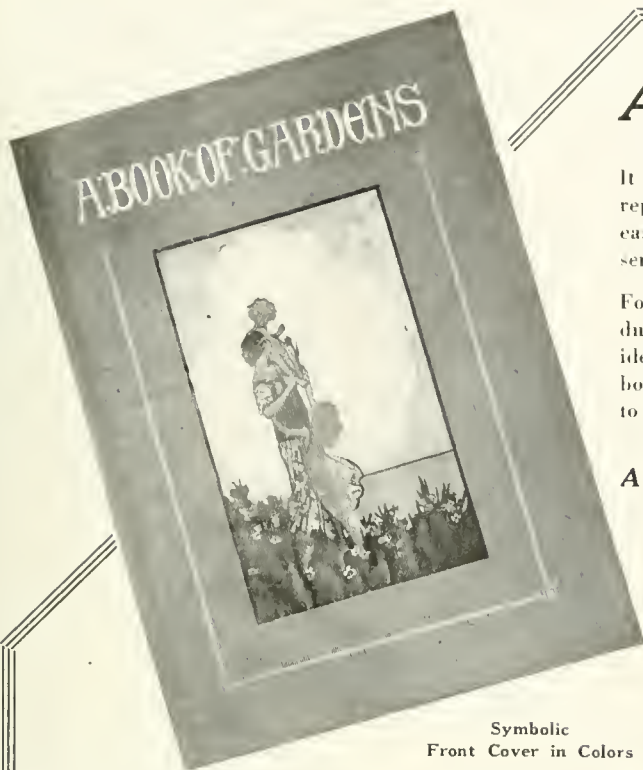
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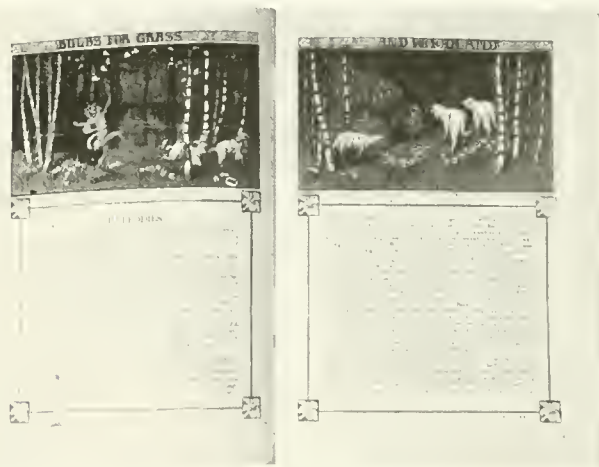
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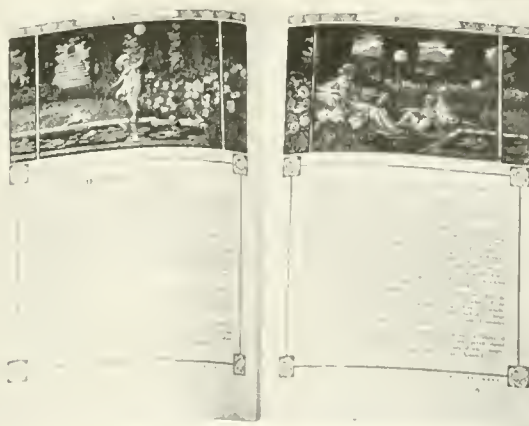
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

JULY, 1920

No. 7

Things and Thoughts of the Garden

MONTAGUE FREE

WE are now in the midst of the open season for insects, and most of us are busy trying to keep them under control. In spite of extensive writings on the subject there are apparently still a few gardeners who have not yet grasped the fact that there is a fundamental difference in the methods adopted to control insect pests which obtain their food by sucking plant juices and those which actually chew their food. Thus we find a prominent grower advocating in his catalog the use of arsenate of lead "to keep away aphids or green fly." This is, of course, preposterous as arsenate of lead is a stomach poison, and aphids obtain their food in such a way, by inserting their beaks in the plant tissue and sucking the juices, that they do not absorb any of the poison. Broadly speaking, sucking insects, such as scales, mealy bugs, and aphids, are best controlled, except when fumigation can be resorted to, by the use of a contact spray or dust which acts by corrosion or by clogging the breathing pores of the insect. Examples of sprays and dusting materials of this kind are nicotine solution, kerosene emulsion, and tobacco dust. On the other hand, those insects which actually eat the leaves of the plants are best dealt with by poisoning their food. This can be done by spraying with one of the arsenical poisons, such as Paris green or arsenate of lead.

The problem of controlling garden pests is not always so simple as some might infer from the preceding paragraph. For instance there are insects which feed in such a way that they cannot be reached by insecticidal sprays. One of these is the beet-leaf maggot which tunnels between the upper and lower epidermis of the leaf. Here the only remedy indicated is to cut off and burn infected leaves. If this is attended to when the crop is harvested it will lessen the danger of trouble the following year. When these pests attack crops which are grown for their leaves, such as spinach and Swiss chard, their depredations are even more serious, for, although it seems impossible to detect any difference in the flavor of leaves so attacked, the womenfolk, even if they are not vegetarians, are somewhat squeamish about finding these maggots cooked in spinach and so when a crop becomes badly infested it is practically valueless. I was fortunate enough a year or two ago when searching for the fly responsible for the beet-leaf maggot to find an insect on Swiss chard which was determined by Dr. Chittenden of the U. S. Bureau of Entomology as a parasite on the pest. Unfortunately I have no reliable data to show whether this parasite is sufficiently active in keeping down the maggot to make it of horticultural importance,

but the impression is that the maggots were not nearly so prevalent the following year.

Many of us, no doubt, inspired by the reports of the success with which the fluted scale was put out of business in California by a species of lady-bug imported from Australia, have had visions of what might be accomplished by finding suitable parasites for all of the pests to which our gardens are subject, but we still have to hustle around with the spray-pump and dust-gun, and will probably continue to do so for sometime to come.

One often wonders if in some of our spraying operations we do not do considerable harm as well as good. The beneficial larvæ of the lady-bug must surely suffer when we spray with nicotine to combat aphids and we are thus in the position of injuring one of our best friends. But, alas! it so often happens that we cannot afford to wait until the industrious lady-bug has cleaned up the aphid colony and so we proceed on the principle that "if you want a job done properly you must do it yourself" and consequently the lady-bug, is an innocent victim.

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While on the subject of pests the English sparrow is at once brought to mind. It is admitted that he has already been pretty well castigated for his varied misdeeds by garden writers in many lands, but I have not yet seen any mention of his fondness for taking a dust bath in the midst of germinating seedlings. Of course those areas which contain very small and very choice plants are always selected as the scene of his abandoned wallowings, with usually disastrous results so far as the seedlings are concerned. A writer in the *Garden Magazine* calls attention to the fact "recently demonstrated at a British experimental station" that sparrows have a horror of blue paper. Most of us suffer from the exuberance of sparrows in the garden at some time or another and any means of repelling them is worth trying out. If strips of blue paper disposed advantageously will prevent them from wreaking their will on the young peas and lettuces gardeners everywhere will be properly grateful for the information. It may be, however, that the English sparrow from long residence in America has become so sophisticated as to refuse to be intimidated by blue paper whether it be of ultramarine or forget-me-not! One of the most effective ways of conveying to the sparrow intelligence the fact that their room is preferred to their company is to trap a few of them with the common "break-back" mousetraps baited with bread. This is a perfectly humane method of despatching them as the traps kill instantaneously. It is not suggested that

it is possible to exterminate a flock of sparrows by this method, but it is possible to drive them away. The sparrow is a wise and suspicious bird and when it dawns upon him that his fellows are meeting with a harsh fate he speedily decides that the vicinity is unhealthy and promptly seeks fresh pastures.

Although at most seasons of the year sparrows are an unmitigated nuisance there are times when their activities may be considered of use. I have seen them very busy at times eating dandelion seeds, which has probably resulted in diminution of weeding operations on the lawn, and often they may be seen feeding on aphids. It is a great pity that the sparrow cannot be induced to mend his ways and behave more as we would have him do for he is a cheerful and likable bird provided there are not too many of him.

* * * *

The perusal of "Modern Propagation of Tree Fruits" by Prof. B. S. Brown gives one an idea of the vastness and importance of this industry in America. We learn that from twenty to forty millions of American grown apple seedlings are used annually in this country as stocks to be budded or grafted with named varieties of apples. In addition, immense numbers of seedlings were formerly imported from Europe where labor conditions were such as to ensure cheap production. Presumably Quarantine 37 will prevent the receipt of any more seedlings from this source. Another item of interest is the fact that "apple seedlings cannot be grown with profit in small quantities. If a firm uses only 100,000 to 300,000 in a season, it is economical to buy rather than to grow them." The industry admirably exemplifies American methods in quantity production, organization, and the use of machinery wherever possible. Machines for wrapping or tying whip grafts after they are made, special spray outfits, mechanical diggers operated by steam or gasoline engines, and power machines capable of cultivating seventy acres a day, are used in the manufacture of our fruit trees.

In spite of the fact that machinery is used to so large an extent, in the actual operation of making the graft dependence rests mainly on a good knife, a keen eye and a skillful hand; for although tools have been invented to facilitate the art of grafting and budding they have not become very popular.

An interesting point as showing how improvements in one industry may work to the disadvantage of another is brought out in the discussion of seeds for apple stocks. Most of the seeds for this purpose are obtained as a by-product from the pomace from cider mills. With the older type of press the seeds came through the mills uncrushed but with the improved cylinder grinders the seeds are more or less cracked, and it is estimated that in order to get one bushel of good seed two bushels must be bought. It calls to mind the wail of the pessimistic showman "what we gains on swings, we loses on the merry-go-rounds."

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The claims of the evergreen *Pachysandra terminalis* as a valuable ground cover need no boosting, but it may not be amiss to direct attention to the merits of its cousin the Mountain Spurge, *Pachysandra procumbens*, as a plant for this purpose. This is a native (which perhaps accounts for its lack of popularity) found in the mountains of Kentucky, West Virginia and southward. It is dwarf, tufted, not more than a foot high, with leaves of a darker green than *P. terminalis*. Like its Japanese relative it is happy in either sun or shade, but unfortunately is not evergreen. This defect, if such it be, is, however, compensated for by the profusion with which

it produces its quaint flowers in early Spring before the leaves appear. Whilst they cannot be called showy, they are interesting and welcome, coming as they do, so early in the year.

Another native plant useful as a ground cover is the shrub Yellow-root, *Xanthorrhiza* (or *Zanthorrhiza arifolia*). A large stretch of this was recently seen on an estate in New Jersey. It was growing in the shade of tall trees where it presented a handsome effect. It has bright green glossy leaves and grows from eighteen inches to two feet in height. The inconspicuous brownish purple flowers are produced in early Spring.

Perhaps the best of the native plants as a ground cover for certain situations is the Bearberry, *Arctostaphylos Uva-ursi*. This is found wild over a considerable section of the country and grows in profusion along the railway banks on the eastern part of Long Island. It is evergreen, clinging close to the ground and when established forms a perfect carpet. It is somewhat difficult to establish unless the right condition is provided, which is a well-drained sandy soil free from lime. Like many of the *Ericaceae* the Bearberry is intolerant of alkaline conditions. It thrives in almost pure sand and seems to prefer a sunny situation. A scientific friend of the writer made the discovery that the long trailing growths provide admirable material for draping the front of winter boxes in Winter if they are not exposed to sunshine. He required something to hide the hideousness of his porch boxes in Winter, fell in love with the glossy coppery-green foliage of the Bearberry and decided to use it. The shoots were cut in November, stuck into the soil of the boxes, kept watered, and remained in good condition until the sun struck them in March. It would perhaps be imprudent to give such information as this were it not that the readers of the CHRONICLE are of the elect. In some circles it might be construed as an invitation to indiscriminately ravish the countryside of Bearberry streamers, which would be most undesirable in sections where it is not too plentiful.

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The most popular *Hibiscus* in the tender woody group is undoubtedly *H. rosa-sinensis* and, like so many of our well known plants is burdened with a multiplicity of common names. Those who insist that a plant must have a common name before they can become interested in it can make their choice from the following: Chinese Hibiscus, "Shoe-flower," "Blacking plant," "Shoeblack plant," and "China rose." The names "Shoe-flower," "Blacking plant," etc., indicative of some connection with the shoe shining industry, were presumably given because of the reported use of the flowers as shoe blacking in the West Indies and elsewhere. The red flowers when crushed turn black which renders them available for this purpose. The Chinese are said to make a dye from them which is used for coloring the hair and eyebrows. A shrub with flowers possessing these properties might perhaps be said to open up possibilities for those who have facilities for growing it and who are interested in reducing the H. C. of L.! It is an "easy doer" and can be grown even by those who are without greenhouse facilities as the plants can be planted out of doors for Summer blooming and stored in a cellar over the Winter. It is very free flowering, and when grown under greenhouse conditions, is seldom entirely out of bloom. There are numerous color forms, red of various shades, white, orange, and yellow. Some varieties are single, others have double or semi-double flowers. A curious form, usually grown for its foliage, is *H. rosa-sinensis* var. *Cooperi*. This has rather narrow leaves compared with the type, with queer pink and white markings on them. The flowers of this variety are frequently deformed.

Plants That Seldom Fruit

W. N. CLUTE

THE common plants of our fields and woods are called spermatophytes, or seed plants, by the botanist, because all normally reproduce by means of seeds, but there is considerable variation in the regularity with which such structures are produced and some plants fruit so rarely as scarcely to deserve the name of seed plants. The owner of an orchard, for instance, is well aware that fruits and their contained seeds can not be counted on in equal numbers every year. There are good years and bad years in the horticulturist's experience, and an inquiry into the causes that reduce fruitfulness is therefore of importance.

The reason why some plants fail to fruit in certain years is not hard to discern. Unfavorable weather at the time of blooming may blast the blossoms and also the hopes of the orchardist. This is possibly the commonest cause of the non-fruiting of orchard plants. While perfectly dormant, the buds may endure unharmed temperatures below zero, but when they become flowers they frequently cannot stand even freezing temperatures.

When a specimen persistently refuses to fruit the condition may be due to the fact that it is sterile to its own pollen. Many cases of this kind are known. The trouble may be remedied by growing trees of some other variety near the unfruitful specimen. Certain apples, pears, and plums are of this nature and absolutely refuse to bear unless other varieties are at hand to supply the necessary pollen. Still other species are dioecious, that is, the stamens and carpels are produced on separate plants. In such cases, of course, no seeds can be produced unless both individuals are present. This is true of some forms of holly, mulberry, fig and numerous others. The willows and cottonwoods always have dioecious flowers.

Unfavorable weather, far above the freezing temperature, may limit production by preventing the visits of the pollinating insects. A spell of rainy weather, just as the flowers are opening, often greatly reduces the crop. The loss from this source, however, is minimized by the fact that all the blossoms do not open at once, but follow one another for several days and that failing to be pollinated they may remain open for some time. In the case of some orchids the flowers if not pollinated may remain open for six weeks, but when pollinated they soon wither.

It is not always unfavorable weather, however, that limits the flower's insect visitors. A scarcity of the insect's food while it is in the larval or "worm" stage may make the mature insect rare and thus have a direct bearing on the crop of fruit. The operations of man are constantly changing the world flora of a region by draining, flooding, burning, ploughing, and the like. If these changes make the food-plant of a species rare, the pollinating insects that frequent some totally different plant may become rare also. The rarity of some of our native orchids is sometimes attributed to circumstances of this kind. This seldom happens to our common plants for their blossoms are visited by a great variety of insects—often as many as eighty kinds—but there are many other species whose flowers are adapted to the visits of a single kind of insect and if this insect is absent, no seeds can result.

One of the most remarkable adjustments of flower and

insect known is found in the association of the yucca and the yucca moth. The flowers of the yucca are pollinated by the moth only. The insect, on the other hand, is closely dependent upon the plant, for its larvæ live exclusively upon young yucca seeds. To insure pollination and incidentally an abundant supply of seeds for the young moth, the mother insect actually collects pollen and carefully pollinates the flowers in which she lays her eggs. This is probably the only instance on record where pollination is deliberately and intentionally performed by the insect. In other flowers pollination occurs through the effort of insects to get the nectar without thought of pollination. The pollen which they bring from one flower is simply brushed from their bodies upon the waiting stigmas of another.

It may also be possible that fruiting is limited by unusual vegetative activity. Fruiting is a process looking to the preservation of the race by the production of new individuals and may not occur when the plant is thriving. Any shock to the life processes of the plant, however, may stimulate it into fruitfulness. This explains the flowers that sometimes appear on trees that have been struck by lightning, or which have been defoliated by insects earlier in the season. In ancient times such blooming out of season was regarded as the sign of an approaching death in the owner's family, but the death it usually presages is the death of the plant that bears the flowers. The florist takes advantage of the fact mentioned when he allows his plants to get potbound. Under such circumstances, they commonly produce many flowers. In a similar way, the removal of some the new wood in August may induce the formation of flower buds in the peach. The removal of some of the roots has the same effect in other plants.

Thus far we have been considering the sterility of normally fruitful plants. There still remains, however, a number of cases of plants that seldom fruit under even favorable circumstances. The common white or "Irish" potato is a striking instance of this kind. It produces blossoms in abundance and yet the fruit is so rare that many potato growers have never seen it. One could make a long list of such plants. Among the number would be included the sugar cane, the bamboo, sweet potato, ground nut (*apios*), lily of the valley bleeding heart, house leek and some varieties of milkweed. It is likely that some of these fail to produce fruit through some defect in the pollinating mechanism, but in other cases the cause cannot be explained thus. It has been suggested, that failure to set seeds may be due to the fact that the species have various vegetative methods of rapid multiplication. It is quite possible that finding such means sufficient the plants are gradually abandoning reproduction by means of seeds. It is to be observed, however, that while seeds and the various devices for multiplying the plants vegetatively are alike in producing new plants, they are not quite alike in function, for the seeds, spread by the wind and other agencies, serve to introduce the species into new regions, while vegetative methods merely multiply the plant once it has gained a foothold there.

Less government, less legislation, less talk, less playing of the political game, and more enthusiasm for work and consideration of the American people as a whole is what our statesmen should strive for.

Increase in the Bee-yard

H. W. SANDERS

IN the article two months ago, dealing with the swarming of bees, we explained that the bee, being entirely a sociable insect, and having no possible means of living apart from the colony, always increases under natural conditions in swarms, numbering many thousand individuals which emerge from the hive and fly directly to their chosen abode.

This is a fact that must be always taken into account when making increase in the number of colonies of bees kept. We have seen beginners ruin a promising yard of bees, by trying to work contrary to the ways of Nature with the result that the bees were weakened in numbers so much that they all die in the next Winter. Every plan to increase must conform to the natural law of swarming, which is that the parent hive has sufficient bees to carry on the work, that the swarm has a right proportion of young and old bees, and that the young brood, or bees in the larval form, are placed where they will be warmed and fed to prevent their being lost, for they are the bees of to-morrow.

Where the beekeeper can be at hand, as in the case of a farmer whose work is at home, or a professional beekeeper with only one yard, it is possible that natural swarming may be the best method of increase. In this case the swarm should be hived and placed where the colony stood and the colony removed to a new stand. If this is not done, the result will be that the hive from which the swarm emerged will swarm again, as soon as the first virgin queen comes out of her cell, about a week later, and sometimes even a third and fourth swarm may come off at intervals of a few days. These swarms will probably be too weak to gather enough honey for Winter, and will likely die before Spring, while the old hive will have lost so many bees that it will gather next to nothing either. But by placing the swarm on the old stand all the older bees from the parent colony return there and join the swarm, which is thus made strong enough to gather a good crop of honey. The colony that has been removed, on the other hand, has lost a good many bees by the return of the field workers, and will destroy all the queen cells except the one necessary to requeen itself, so that there will be no afterswarms. It can then build up to Winter prosperously.

It is often, however, impossible to watch the apiary for swarms. There are many beekeepers who go out to work elsewhere during the day, or who do not feel that they can spare time to leave their work and start away to hive a swarm, and the large beekeepers have usually quite a number of outyards and go around to them in an automobile, so that they cannot be at hand in all their yards to watch for natural swarming. In such cases we must make artificial increase, or else our swarms will fly to the woods, and the number of our colonies will decline each year, instead of increasing.

In order to start a hive of bees it is necessary to have a queen bee with sufficient worker bees to feed and tend the young ones that will emerge from her eggs, and which in turn will raise another generation, so that the new colony may grow in numbers enough to have a large cluster in time for Winter. We may even give the newcomer a start in life by giving some brood, as well as a queen and workers, provided always that there are enough bees present to give it adequate care, for brood will chill and starve quickly unless there are plenty of bees present. We have also to remember that bees that

have once "marked their location," will always return to it, unless carried several miles away, or unless they swarm, so that if our new colony is to be placed near the ones from which the bees are taken, they will have to be induced in some way to accept their new home.

A queen bee is easily provided. There are many dealers who make a profession of raising queen-bees for sale, and the bee journals contain advertisements of queens for sale. If, however, the season is not too far advanced, a queen may be raised at home at the same time that the new colony is formed. The chief advantage of the purchased queen is the saving of time. The following is the actual method whereby the foregoing principles of management are translated into practice.

The colonies are inspected once a week, and watched as the season goes on. Plenty of room is given for the storage of honey, and each week a close watch is kept for preparations towards swarming. These will be found in the presence of queen cells, being long cells shaped like peanuts and built over worker or female larvæ. When these are found the colony is ready for treatment. The queen is found, and left with two frames of brood in the hive and the vacancies filled with empty combs or full sheets of foundation. The combs taken away are now freed of bees by shaking or brushing them in front of the hive. These frames of brood are placed in a hive body and put above a second colony, with a "queen-excluder" between. This latter is a piece of zinc perforated so that a queen cannot get through, although workers can. It prevents the queen of the second colony from access to the brood, but enables the workers to feed and tend the hatching bees. The queen cells started for swarming purposes will be continued, since the queen has no access to the brood, and in about ten days' time they will be nearly ready to hatch. There will be no very young bees to die from starvation and cold, and there will be plenty of honey to give the new colony a start. Therefore we can now divide up the brood.

Suppose that six combs of brood were taken from the colony that was preparing to swarm. Well, we can now make three new colonies. We take two frames of the mature brood, with at least one queen cell, or a purchased queen in a cage, and we then place these two combs in an empty hive, and we stuff the entrance full of grass. By the time the grass withers and lets the bees out they will have forgotten their old home and will accept the new one. The cell will have produced a virgin queen, who in about a week will fly and mate, or if a queen is bought the bees will release her from the cage in about three days. In either case we shall have succeeded in getting a queen in a new hive, with enough bees to look after her, and with bees that have accepted the new location. It is often well, when the colony has got a start to help it with a frame of brood from another one, especially if the season is advancing, and in case we make any increase very late, say after August 1st, we always build it up to strength immediately.

When in doubt, just keep on keeping on. When you have made a mistake, do not stop, but keep on. Your sanity and your safety lie in keeping on. Dwell on failure and you will land in the ditch just as sure as the novice bicycle rider unwillingly heads his wheel in the direction of his thoughts.—*The Silent Partner*.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

AT this period of the Summer there is not anything so important to be done in the garden as thorough and constant cultivation, to conserve the water in the soil for the growing plants. Proper and abundant cultivation reduces the necessity of watering to a minimum, yet oftentimes it becomes a necessity to resort to artificial watering. Then the advantages of a good irrigation system are more than patent to every gardener, and any one of the many systems now on the market is a good investment, and a real money saver in the long run. When watering, do it thoroughly, so that it seeps down deep, and avoid the fatal mistake so often made of wetting an inch or so at the top, thus attracting the roots to the surface, to be damaged or destroyed by subsequent drouth.

Aphis of all kinds make their presence felt in the garden at this time, and on the fruit trees too where they will soon do untold damage if left to themselves. Nearly all garden crops are more or less subject to attack, but a timely spraying with some approved insecticide, which is offered ready made by dealers in horticultural supplies, will keep them in check. Asparagus should be sprayed with arsenate of lead, or dusted with hellebore powder early in the morning before the dew is off, to keep the larvæ of the asparagus beetle under control.

A couple or more sowings of beans may be made this month. Beans are subject to rust and an occasional spraying with Bordeaux Mixture will pay for itself. Beets and carrots may still be sown for succession, and the last sowing for the Winter supply should be made towards the latter part of the month. Put in several rows of each for a good Winter supply for vegetables are not likely to be cheap or plentiful the coming Winter.

Ruta-bagas, for winter use should be sown now, and late in the month one may well sow peas again, since they do very well if one has any means of watering them at all. Late crops of cabbage, cauliflower and celery should be set out, and in doing so be sure and puddle the roots in water. Frequent spraying will keep the plants from wilting, and assist them becoming established. Look out for rust on the celery, and give a spraying with Bordeaux Mixture. Spray the potatoes regularly with Bordeaux and arsenate of lead for bugs, and blight. Early varieties will be ready to use this month. But don't dig them save as needed for daily use as they increase rapidly in size at this time. Feed your leeks and onions with liquid manures at this time and use nitrate of soda if you really want quality.

In the flower garden all continuous flowering plants such as coreopsis, gallardias, pyrethrums, etc., should be kept free from seed pods by keeping the flowers picked clean, or they will soon stop flowering. In dry seasons a good mulch of well rotted manure is preferable to watering especially on the continuous flowering varieties, and those that flower in the Fall. Nasturtiums and other soft succulent plants soon suffer from attacks of aphis, and should be sprayed frequently, with either tobacco extract, or kerosene preparations. Remove the terminal growths of geraniums with the forefinger and thumb if really bushy plants are needed. The biennial types of *Campanula* and foxglove as well as similar plants should be torn up and thrown away after they are through flow-

ering. Prepare a supply of seedlings of these plants for next year by sowing seeds now. There are a number of annuals which will furnish a supply of cut flowers in the Fall if sown now; among which may be mentioned Mignonette, candytuft, annula *Gypsophila*, *Plox drummondii*, *Calliopsis* and cornflowers. To keep sweet peas flowering right along they must never be allowed to suffer for want of water at the roots. Give them a thorough soaking, then apply a thick mulch. Sweet peas are gross feeders and must have plenty of plant food available. Long stems and high quality flowers are the result of disbudding, and regular feeding with highly concentrated fertilizers.

In walking round the orchard, if you find the leaves of the apple trees all curled up you may depend upon it that aphids are having a gay time, and spraying should be done to keep them under control. The month's big job in the orchard is summer pruning and all trees that have attained fruiting size lend themselves to this treatment. It is simply a restriction of the growth by pinching off the ends of the shoots, which has a tendency to make the trees fruit. It is a matter for regret that summer pruning is not practised more freely than it is, but there are many people who will prune anything while it is dormant, yet cannot bring themselves to cut anything in active growth as though it would bleed to death. But those who harden their hearts and sharpen the pruning knife, and prune intelligently, will find the time thus spent a profitable investment. Summer pruning is practised for three specific purposes; to train plants to shape, as in the case of dwarf and trained fruits; to prevent undesirable growth, as in removing buds or sprouts from fruit trees, grape vines, etc., and to keep in condition all flowering shrubs, and trained ornamentals, which form buds this season for flowering another year.

In training plants to shape the pruning to be done is chiefly of the type known as "heading in," that is, cutting back the lateral or upright growths in order to produce the general plant form most desirable. In doing this it must be remembered that the bud or eye nearest the cut will be the one most likely to throw out the strongest growth or leader to take the place of that removed. At the same time all the growth below the cut is stimulated as the new leader is not able for some time to take care of all the sap that has been going to the growths which have been pruned away. For this reason it is well to consider the position of the bud immediately below the cut, and the direction the new shoot will be likely to take. Where an open centre is the objective this bud should be left on the outside. If there be a hole in the head of the tree to be filled it may be necessary to branch into it from one or more points. Another point to keep in mind is to prune the wood while it is still young rather than cut it out after it has grown to maturity. Pruning to remove surplus growth is more a process of disbudding than one of pruning. Go over the grape vines and remove any shoots that may have started below the head or where you do not want them. Heavily pruned apple trees are likely to throw out numerous water sprouts, and these should be removed while they are yet small. Of course should a growth develop in a position where it will be likely to form a useful limb it should be allowed to remain.

The heat and drouth of summer readily determine whether or not the lawn is well made or not. If it doesn't seem to be holding its own give a topdressing of nitrate of soda, and fine bone meal, until the time for doing a more thorough job the latter part of next month or early Sept. The best expedient to adopt at present is to mark the spots that do not show up well, and leave the grass a little longer without cutting. Humus is fine material for lawns, and where its use is contemplated when remaking the lawn a supply should be ordered to be one hand when needed. The best seeds obtainable are the only ones to use for seeding down the lawn and the heavier the mixture is per bushel the better, provided the weight is not due to an excess of white clover seed.

Plants in frames which are intended for Winter flowering should be given the best of care at this time for to neglect them now will surely mean disappointment later.

Freezia bulbs that were forced last year, and had good attention in the way of drying off will make fine bulbs to plant now. Planted thus early it is not difficult to get them in flower by Christmas and the New Year. Plant them in either pans or flats two or three inches apart, in new well drained soil. Three parts of fibrous loam and one each of cow manure, and leaf mold make a very good growing medium. Place them in a cool cellar until the growths begin to show through the soil when they may be placed in full light in a cool house. Give water sparingly until the foliage is well developed.

The carnation plants should be kept growing whether in the field or in their permanent flowering quarters. Those that have been given field culture while the houses have been fitted up to receive them should be planted indoors as soon as possible now, for the sooner they become established the better. Keep the shoots pinched as they require it, to form bushy plants, and don't be afraid to use the hose should red spiders attack the plants.

Seeds of such vegetables as it is intended to force the coming Winter should be ordered now, such as tomatoes, cauliflower, spinach, beans, lettuce, etc. If one has a suitable house where a temperature of round 50° can be maintained New Zealand Spinach is one of the best producing crops one can grow. Sown now it will maintain a continuous supply all next Winter. Parsley may be started from seed either in frames or a cool greenhouse for Winter use. Water cress is easily grown in a violet house temperature, or in frames, but if grown in a temperature above 45° it is difficult to keep it free from aphids.

Chrysanthemums will need to be fed freely now, using liquid manure, and concentrated fertilizers. They will take this food in enormous quantities as they are now growing rapidly. Spray the plants freely several times a day and keep all possible air on them. Be on the watch for black flies, that always gather on the tips of the growths.

This is the season for mildew in the rose house, and if necessary a little fire should be started during dull damp weather, and a little sulphur painted on the pipes. Keep the air on as much as possible so that the plants don't get soft. Annuals, for forcing such as stocks and mignonette, may be sown now. They always do better when sown early and grown on slowly.

Cold storage lilies should be planted this month if early flowers are called for say round Thanksgiving, and on to Christmas. Don't let the bulbs lay around, but get them into the pots as soon as convenient. They will require 5 to 6-inch pots according to their size. Give them a liberal proportion of well decayed manure, and bone meal in the soil, also plenty of drainage as they will need lots of water later on. The best place for them while they are making roots is in a cool cellar, or failing this, under

the bench in a cool house and covered with excelsior, or other medium. See that they are well watered before they are put away, and as soon as they show top growth they may be removed to a cold frame with some sashes over them but leaving plenty of air on, until they have developed a good root system, when they may be placed in a warm house.

Early flowering sweet peas should be sown by the end of the present month. To do well in the greenhouse they should have at least 8 inches of soil, but where a solid bench can be devoted to them they are much happier. Whether in solid beds or raised benches a rich growing medium is a necessity. Two parts of good loam to one part of well decayed manure and some bone added is about the mark to aim at. If the space on the benches is not ready, sow out a few pots now and plant to the flowering quarters in four or five weeks. Do not, however, let these plants dry out or become pot bound or they will be liable to prove disappointing. When planted out in the benches keep plenty of ventilation on both day and night, and on all fine days given them a good syringing.

CHINESE WISTARIA

ONE of the best known vines in cultivation is the Chinese Wistaria, *W. chinensis*, the large purple flowers of which do so much toward making the floral display of flowers in Spring so delightful. The one of our notes is the white flowered variety, *W. chinensis alba* and wherever seen in flower it calls for the admiration of those who view it. Though long known to horticulturists, it is not nearly as well represented in collections as it deserves to be. Its charms are numerous, rivaling in many respects the common purple species.

The Wistaria takes its time coming into flower, years usually elapsing before a small plant blooms, as it invariably makes considerable growth before giving its attention to flowering. When trained as a bush, it blooms sooner than when set to some support, as it more readily makes flowering spurs while the growth is less vigorous. Besides flowering earlier, the bush or standard forms of the Wistaria, are beautiful objects when in bloom, for a lawn or similar open position.

The common species can be propagated from seeds readily, but in the case of the white flowered, or of any other variety, layering is the preferred method of increasing them, seedlings not being reliable for coming true to color, though some may do so.

The Wistaria is also amenable to pot culture and, when so grown, it makes an excellent forcing subject. The Japanese are adepts at producing small specimens which are used for prominent positions in their artistic landscape gardens. Beautifully flowered plants, some 3 ft. or 4 ft. high, are often exhibited at the early Spring shows in Europe and there is no reason why the Wistaria should not take a prominent place as a decorative plant. It goes without saying that flowering plants cannot be grown in one season, but in this respect it is more or less on a par with other hard wooded plants such as the Acacia. By spurring back the lateral growths, flower buds are induced to develop.

For small standards, the young plants, which are obtained by layering young shoots, are kept tied up to the desired height and then induced to break by pinching. A wire frame, or one made with cane and sticks, serves to keep the head in shape. To insure a dense head two or three stems should be carried up. Pots of 12-in. to 15-in. are large enough for a plant of fair size. Layers require twelve months before they are ready for severance from the old plant.—*Florists' Exchange*.

Ornamental Flowering Trees

By ARBORUM AMATOR

(The Conclusion.)

A FEW of the large flowering trees are suitable for roadside planting, and all of them for parks, and large estates either along boundary lines or for outlining wide driveways or as single specimens on open spaces, and in the foreground of large evergreens.

The Tulip Tree. Our native tulip tree (*Liriodendron tulipifera*), sometimes called Tulip Poplar, and also Whitewood, often attains a height of 150 feet. This and its symmetry of form help make it one of the noblest trees of our forests. Its growth is very rapid. If top pruned when young, it will take on a rounder, lower form, and its handsome flowers can be more easily seen, but the tree will not be so stately. Amid its handsome foliage of a unique bluish-green color there appears in May a profusion of tulip-like orange and green flowers. In the Autumn the foliage takes on a golden tint, and the tree looks like a beautiful tall, yellow pyramid. This tree is suitable for planting along wide roads and broad avenues, as well as in parks and on large estates. The Tulip Tree should be transplanted in the Spring. Robert Herrick well describes the flowers of this tree:

"Anxiously they sought
The *liriodendron*, with its varied bloom
Orange and green and gold."

The Western Catalpa. The Western Catalpa (*Catalpa speciosa*), is a much larger and taller tree than the species, *bignonioides*, previously mentioned often attaining a height of 100 feet and more. Its showy white flowers spotted with purple appear in June.

The Pagoda Tree. The Pagoda Tree (*Sophora Japonica*), a native of China, sometimes reaching a height of 80 feet, is hardy as far north as Massachusetts. Its blooming period is from July to September when very few trees are in flower. In these months it bears clusters of creamy white, pea-shaped flowers, amid its delicately colored soft foliage. There is a variety of this, *pendula*, which has slender and gracefully drooping branches.

Locusts. *Robinia pseudacacia*, whose common name is yellow locust, but is also called black locust, forms a large tree sometimes 80 feet in height. This is not only a valuable timber tree, the wood of which is very lasting, but in June it produces in abundance beautiful, fragrant white flowers in drooping racemes among its pinnate leaves. These blooms contain much nectar.

The locust is a leguminous tree and its blooms are followed by broad seed pods which as well as the seed within them are shaped like those of beans. Of this tree Dante says:

"Honey and locusts were the food
Whereon the Baptist in the wilderness fed."

Horse Chestnuts. The Horse Chestnut (*Aesculus hippocastanum*), a native of Greece and Bulgaria is hardy in the north. The dark green, handsome palmate leaves of this tree afford a heavy shade as early as May and among these in that month appear great Hyacinth-like clusters of flowers making the tree look like an immense bouquet. There are several species; *hippocastanum* bearing white flowers tinted with purple and yel-

low; *flore pleno* a double flowering variety; *carnea* bearing flesh colored, *Briotii* scarlet flowers and *rubicunda*, red flowers. *Carnea* having a rounder head, and *Briotii* more slender branches than *hippocastanum* and *rubicunda*, are three of the most beautiful flowering trees in cultivation. Horse chestnuts thrive best in a cool moist soil on a lawn and where there is some shade, and should not be given a hot and dry location.

Magnolia Acuminata. There are several large Magnolias. The Cucumber Tree (*Magnolia acuminata*) is indigenous from New York to Georgia and west to Illinois and Arkansas. Where a tall tree is suitable it equals if not surpasses the tulip tree. The glaucous green flowers of this tree, which appear in May and June are followed by cylindrical pink fruit. The species *cordata*, a native of Georgia and Alabama, is a smaller tree bearing smaller canary yellow flowers.

Magnolia Grandiflora. The Bull Bay (*Magnolia grandiflora*) and its several varieties, indigenous from North Carolina to Texas, is a tall evergreen of pyramidal form. This noble tree, sometimes reaching a height of 80 feet, produces large white flowers with purple stamens from May to August. This species is not generally hardy north of Philadelphia.

Campbell's Magnolia. Campbell's magnolia (*Magnolia Campbelli*), a native of the Himalayas, is indeed a beautiful tree but hardy only in the south. In May its large flowers appear pink and white within, and crimson without, and are followed by greenish-brown fruits. This is the Magnolia of which Caroline Gilman writes:

"There lowering with imperial pride
The rich magnolia stands."

Magnolia Kobus. *Magnolia Kobus*, a native of Japan, expands its white flowers in April, and they are followed by brown colored fruits. This is one of the hardiest of all the Magnolias but not as free blooming, and showy as most of the other species.

Magnolia Hypoleuca. *Magnolia hypoleuca*, having a broad pyramidal head, sometimes reaches the height of 100 feet. The fragrant white cup-shaped flowers of this tree, six to seven inches across, whose beauty is enhanced by their scarlet filaments, are followed by brilliant scarlet fruits eight inches in length. This native of Japan blooms in May and June.

When we make out next tree planting may we not from these many ornamental flowering trees, presenting such a variety in size and foliage, color and shape of bloom, and in habit of growth, select some which we may plant in place of the usual, omnipresent, large, deciduous and evergreen shade trees.

There is no hope in heaven or earth for the man who knows not the meaning of endeavor. By the measure of each man's endeavor, and by that alone, shall he achieve. Who strives to climb the mountains tops if he strive with a whole soul's tasking, shall in the end stand triumphant at the summit; equally shall he who strives but to climb a mole-hill also arrive. Endeavor is a power with the driving force of electricity, and the vastness of the wind, and, like both of these, its power works unseen. By the strength of endeavor all things are possible; how many men rose to the heights of a world-famous success by no other power than that of their own endeavor.—FORBES

Twelve Hardy Perennials for Cut Flowers

THE great virtue of this class of plants as garden flowers is now an established fact and no garden can be called complete unless it contains at least some of them. Their permanency, their brilliancy when in bloom, and their ability to lend themselves equally well to the landscape or to decorative work such as cut flowers, make them almost indispensable at a time when greenhouse cut flowers are taking a much-needed rest. In naming a limited number of kinds one has to omit many having claims for inclusion in the list but for all-around usefulness the following is my choice of twelve:

1. *Pyrethrum hybridum* or Persian daisy—probably so-called from the Greek pyr=fire—referring to the acrid roots of the genus. Their pretty fern-like foliage in the Spring is followed by the profusion of brilliant double and single blooms in Summer, which are unequalled as cut flowers and for house decoration. There is almost nothing so artistic and attractive as a vase of these flowers. They are of very simple culture and very hardy.

2. The peony, according to the old Greek legend, was named after the physician, Pæon, who used the plant to cure a wound inflicted by Hercules. The peony (although its flowering season is very short) is probably one of the best hardy plants for cut flowers, bearing large and handsome flowers deliciously rose scented. The peony season can be extended fully two weeks by cutting the buds when just showing color, wrapping tightly in wax paper with the stem end open, putting into deep vases and then into cold storage. The water in the vases should be changed frequently.

3. *Corcopsis grandiflora* is the most serviceable hardy plant of large daisy-like golden flowers on 2 ft. to 2½ ft. stems, blooming profusely from June until late Autumn, uninterruptedly, particularly so if the flowers are constantly cut. As a cut flower to last this is one of the best.

4. *Veronica* (speedwell, cancerwort), is a splendid plant which gives us some of our most useful material for the hardy border and, because of its rich shades of blue, furnishes us with a rare color and is unexcelled for cutting purposes.

5. *Gaillardia grandiflora* (blanket flower) a showy plant covered with flowers from June until frost, a feature quite rare with perennials. The daisy-like flowers of unusual colorings produce a fine effect in the border and are excellent for cut flower purposes, having good self-supporting stems and lasting a long time in water. The flowers should be kept cut to ensure a continuity of bloom and strong plants.

6. *Physostegia* (false dragon head, American heather) tall perennial, native to this country, at best during August, a month which gives us few choice perennials to cut from, and this is a splendid one for cutting.

7. *Centaurea montana* (cornflower) is a good subject of easy culture, being effective in the border and invaluable for cutting, bearing large blue flowers from June until August.

8. *Chrysanthemum* (shasta daisy or giant moon-penny daisy), absolutely hardy and of easy culture, but to obtain the best results the flowering shoots, which appear soon after the Spring growth of foliage, should be removed until Midsummer, after which the flowers will be much larger, have better stems and form one of the finest cutting materials.

9. *Scabiosa caucasica* (pincushion flower), are very handsome border plants which produce a succession of flowers from June until frost that are very serviceable for cutting purposes.

10. *Anemone japonica* (windflower), divide themselves into the Alpine or Spring and Summer varieties, and the Japanese varieties. The latter are among the most gorgeous of the hardy perennials as well as being among the most useful, as they bloom from August until frost kills them; they are of inestimable value as cut flowers. The Alpine varieties are also good for cutting but quite short of stem and perhaps not so good as the Japanese in this respect.

11. *Delphinium* (larkspur), is one of the loveliest blue flowers in existence; its range of shades and throat markings are unapproached by any others, varying from the palest blue to the darkest indigo and violet. It is of the easiest culture, being very hardy. The spikes are superb for cutting purposes, and if cut to within a few inches of the ground immediately after blooming another bloom may be obtained at the end of the Summer.

12. *Helianthus orgaylis* (willow-leaved or sky rocket sunflower), so-called from the brilliant color of the flowers. This is probably one of the finest of the sunflowers. It is rather tall growing, ranging from 6 feet to 10 feet, but a specimen plant has all the appearance of a fountain of yellow flowers. The latter lasting well as cut blooms in September and October.—*Southern Florist*.

Timely Advice.—Naturalist (displaying a flower he had just plucked): "Young man, do you know to what family this blossom belongs?" Boy: "Mrs. Jones'; and y'd better beat it before she knows ye picked it."—*Country Gentleman*.—P.

THE BEAUTY OF AGE

It is sad that Old Time is so swift to dismember

All our castles in Spain—that they crumble so soon,
That the churl will not spare, for the snows of December,

One rose of the many he squanders in June:

But 'tis ordered by Nature and idle to quarrel

With the sovereign mother who never deceives;

If we cannot have roses we sometimes have laurel,

And the laurel is sweet though made only of leaves.

It is sad that the fugitive Graces will leave us

When the wrinkles have come and the face has grown grim,

And the dear little Loves, though afflicted to grieve us,

Will fly from the eyes that are hollow and dim;

But 'tis known that the delicate bloom on the flower

Is the fleetest of all those delectable things

Which are meant to be tempting for only an hour,

And that Cupid—the sprite—is provided with wings.

When the sky's growing dark and the red sun is setting

We should stir up the embers, and call up the Elves

Of Mirth and Content, and, all troubles forgetting,

Make a gay world for others—and so for ourselves!

'Tis the beauty of Age to be tranquil and gentle,

Whatsoever may happen resigned to its lot,

And though gray locks and crowsfeet are not ornamental

There's a grace in the wearing to make them forgot.

So, a welcome to all that my Fate may provide me,

Be it joy or sorrow, a cross or a crown!

Here's a grasp of the hand for the comrades beside me!

Here's a smiling good-by as the curtain comes down!

And when the play's over, and everything ended,

And you hear in your musing the sound of a knell,

Give me one loving thought for the good I intended,

And a rose for my pall, as you bid me Farewell!

—Wm. Winter.

THE PLANTAIN LILIES (*Funkia*)

THE *Funkias*, or Plantain Lilies are a small group of Japanese plants belonging to the Lily order, and invaluable in the main for the fine foliage effects of the established specimens. This is particularly true of the bolder members of the race—*Fortunei*, *Sieboldiana*, and *subcordata* (*grandiflora*)—which, in the course of years, will spread out into handsome speci-

cramping should exist no jumbling together in thicket-like density, calculated to mar or belittle the fine characteristic leaf beauty of these plants.

The most important item, once they are well planted, is that they be left alone, since frequent disturbance hinders progress, and is belittling in its effects. Robust by nature, it is hardly possible to treat the boldest of these plants too generously, whether as to soil or soil richness, and given a good depth of soil, specimens 3 feet high, without the flower-stems, may result in a few years. Of equal importance is root moisture, or that uniform degree of soil coolness which is not a bad substitute. Occasionally one sees these plants beside lake or pond, and they are certainly well suited to such association provided the soil has been well prepared. The observant planter will not lose sight of the fact that the root system has a lateral inclination, and will make provision for it accordingly. Apart from the fine effects obtainable in the open garden, greater use should be made of these Plantain Lilies in tubs for terrace gardening, giving the plants generous treatment throughout. Thus grown it will be found that liquid manure and abundant supplies of moisture are of the highest importance. The smaller-leaved kinds—as e.g., *F. undulata variegata*—are serviceable as small pot plants for the greenhouse and in decoration generally. Autumn is the best planting season, though the plants, inclining rather to perpetual rooting, may be transplanted over the whole of their dormant period with ease.—*Garden* (Eng.)



The garden pool at Planting Fields, the country estate of W. R. Coe, at Oyster Bay, L. I. The use of Darwin Breeder and Cottage Tulips planted in an harmonious color scheme, gives much life to the garden during May.

mens 3 feet to 4 feet across. At such times they are noble indeed, and worthy of the best positions the gardener can give them. Some of them—and those above-named more particularly—are also highly ornamental when in flower, though they are chiefly valuable for their bold and striking leafage. In this latter respect they are unique among strictly deciduous herbaceous plants. Hardy in the extreme, not presenting any cultural difficulties, they rank high in the estimation of those who know them best, and have grown them well. Too bold for inclusion in any border of herbaceous plants, they should be employed apart or in isolated groups, where the great, spreading tufts of well-marked, gracefully recurving leaves may be seen to advantage. On occasion, and with full appreciation of their ultimate leaf development, they may be used as marginal subjects, to hold belts of Rhododendrons, more particularly where these shrubs are generously disposed in bank-like outline. No idea of



A view of the pool from the mansion, showing the tea house in the background. After the bulbs have flowered they are removed and the areas are planted with annuals for summer and autumn effect.

The Display of Autumn Colors

THERE can be few places in the world where colors of ripening leaves are so varied or are continued through so many weeks as at the Arnold Arboretum. For the leaves of the plants of eastern Asia, which are well represented in the Arboretum, usually are beautifully colored after those of our eastern American trees, with the exception of the Oaks, have fallen. A few conspicuous exceptions to this general rule are worth noting. Nearly three weeks before the leaves of the Red Maple (*Acer rubrum*) have begun to change color, those of the Cork-barked tree of Eastern Siberia (*Phellodendron amurense*) are bright gold color, making the two trees on the right-hand side of the Meadow Road the most brilliant objects in the Arboretum. After these trees have been bare of leaves for several days they are still interesting objects, however, for after the leaves are gone it is possible to see clearly the pale, deeply furrowed soft corky bark of the trunk and large branches to which this tree owes its name. The genus *Phellodendron* is confined to eastern Asia, and the five species now known are well established in the Arboretum. On account of its bark, *Phellodendron amurense*, the type of the genus, is perhaps the most interesting species. The others, however, are larger and more shapely trees, and the species of northern Japan and Saghalien (*P. sachalinense*) is well suited for street planting. The pungent oil which abounds in the leaves of these trees protects them from the attacks of leaf-eating insects. Another conspicuous exception to the rule that the leaves of Asiatic plants change color later in the Autumn than those of eastern American plants is found in the Burning Bush, with winged branches, *Euonymus alatus*, a native of Japan and Korea. The flowers and fruits of this plant are small and inconspicuous, but few plants surpass it in the beauty of its rose-colored Autumn foliage, which is unlike that of any other plant in the Arboretum. This plant, if it gets the opportunity, will spread into a shrub from ten to fifteen feet across, with lower branches laying close to the ground, and will form a compact round-topped head. It is a plant, however, which unless it can have plenty of room in which to grow is not worth a place in the garden. *Acer ginnala* is another Asiatic plant which takes on its autumn colors early. This small maple, which is a native of eastern Siberia, Manchuria, and Korea, is not surpassed in autumn brilliancy by any American Scarlet Maple. One of the early introductions of the Arboretum it has been taken up by some American nurserymen and is now sometimes found in northern gardens.

Another Korean and Manchurian maple, *Acer mandshuricum* also illustrates the fact that the leaves of some Asiatic trees turn color and fall early in the season. This is one of the group of maples with leaves composed of three leaflets and one of the largest and handsomest trees of Manchuria and northern Korea. Like those of a few other plants, notably the Japanese *Acer nikoense*, the leaflets of this maple retain in Autumn the pale color of their lower surface which increases the beauty of the bright red upper surface.

Little attention has been given by park and garden-makers to the selection and arrangement of

plants to produce brilliant and harmonious Autumn effects of Autumn colors, with the result that there is less beauty at this season of the year in planted grounds than it is possible to obtain. Trees and shrubs grouped to produce the best Autumn color effect would compose well at other seasons of the year. The success of such an arrangement of plants depends on knowledge which can only be obtained by the constant study at all seasons of the year of living plants. Opportunity for such study is found in the Arboretum, in which nearly every tree and shrub which can grow in the northern United States is established. The leaves on some individuals of a species turn more brilliantly than on other individuals of the same species and this individual character is constant from year to year. It is therefore possible to increase the number of trees with exceptionally handsome autumn foliage by grafting or budding, grafts or buds being taken from selected trees worked on stock of the same species, as trees with pyramidal or pendulous branches are propagated. The value of propagating trees for the Autumn color of their leaves is shown by a Red Maple tree. This tree was obtained by grafting a Red Maple seedling with a branch of a tree growing in Brookline with crimson Autumn foliage. The leaves of the grafted tree have the same color as those of the Brookline tree, and for more than two weeks this tree has been the brilliant object of the Arboretum. Near it are standing two seedling Red Maples. The leaves of one of these trees turned pale yellow and are fast falling; from the other the nearly green leaves have already fallen.—*From the Arnold Arboretum Bulletin.*

CHOCKECHERRY FOR THE GARDEN

OUR common Chokecherry or *Prunus virginiana* due to its suckering roots tends to develop into a shrubby clump of its own, though with a little attention it can be grown either as a large shrub or small tree. It is not to be recommended for general planting, particularly not where a more cultured specimen of shrub or small tree can take its place, but to tidy up the ragged ends of a place it is sometimes about the only thing that will grow satisfactorily and persist. Its roots will push their way through almost any kind of a soil and once established the plant is drought resistant. Left alone a Chokecherry will sooner or later occupy all the ground available. Growing at its own sweet will a few of the innermost shoots develop into small trees while the outermost shoots grow as short canes that carry the foliage of such a clump down to the ground. If one has a mind to do it a Chokecherry can be grown as a well balanced lawn tree while the persistent suckers that keep springing up all about the base of the tree can be easily held down with the lawn mower. They do not injure the lawn. During its blossoming time, a period of about two weeks, a Chokecherry clump is really pretty and the fragrance is all pervading. When the fruit is ripe there is a feast for the birds, robins appear to be especially fond of it. This is a point in its favor not to be forgotten. As a means of screening an objectionable view, especially on poor soil that cannot be given much preparation and where subsequent care is out of the question, *Prunus virginiana* is to be recommended.—*The Garden Magazine.*

The Living Soil

A FERTILE soil, especially well provided with humus, is teeming with life; indeed, it must contain these living organisms in order to be fertile and to support plant life.

The soil, then, is not a lifeless lump of clay. When well tilled, it is full of pores like a sponge; and when in the best condition for plant growth, these pores contain an abundance of air as well as water. We may thus think of the soil as a honey-combed, spongy mass, made up of a hard framework composed of bits of mineral matter, the rock-particles, plastered over with a jelly-like substance (the decaying organic matter, or "humus"), containing countless billions of bacteria and other germs.

The great majority of these living organisms are present in the surface soil, where the humus is, and where the tilling of the soil has provided the porous, well-aerated condition necessary for the growth of the beneficial germs.

Further, their activity is greatest as a rule in late Spring and in Autumn, and lowest in Summer and Winter. For the Winter cold checks them, as well as the Summer dryness. The warming of the soil in Spring, together with the Spring rains, bringing an abundance of oxygen washed down out of the air, as well as the needful water, apparently cause the great outburst of germ activity in late Spring. The Autumn maximum may be attributed to the effect of the Fall rains coming after the heat and drought of the Summer.

There are both good and bad soil organisms. Some bring about the decay of plant and animal remains and the consequent liberation of plant food; others do much harm, especially in causing "sick soils." The most of them are microscopic in size; others can be seen with the naked eye, such as the beneficent earthworm which burrows through and feeds on the soil humus, letting in air and drawing down leaves and other debris from the surface.

Beneficial soil organisms.—These, fortunately for us, are readily controlled and their growth encouraged by certain proper agricultural practices. These beneficial organisms, in the first place, need a well-aerated, light, loamy soil for their best development. In a heavy, sticky, clay soil, devoid of humus, or a water-logged, sour, mucky soil, they will not grow. But in the soil made sweet by the addition of lime, well-stirred and oxygenated by cultivation, with a plentiful supply of decaying vegetable matter (humus), and, finally, with a sufficient amount of mineral nutrients in soluble form, the beneficial soil organisms flourish, and the harmful ones are killed off or at least kept in the background.

The decay of plant and animal remains is brought about by beneficial bacteria and soil fungi; by this means, finally crumbling into dust, they again become dissolved in the soil water and thus available for plant food. Plant and animal bodies are composed of at least ten elements united into complex organic compounds: *Carbon, Hydrogen, Oxygen, Nitrogen, Sulphur, Phosphorus, Potassium, Iron, Calcium and Magnesium*. Those in italic are the ones which are most apt to need replenishing in soils, and these the farmer often supplies to impoverished soils in the form of "artificial fertilizers." Of course if he would add to his poor soils manures and plow in legumes, the final decomposition of these organic materials would supply all the necessary elements. Manures, however, are often poor fertilizers, from having been carelessly

preserved and allowed to leach away and otherwise lose ammonia and other valuable materials.

Ammonification is the production of ammonia by bacteria and molds from manures and other decomposing organic bodies. This is accomplished by breaking-down processes comparable to digestions, performed by the enzymes secreted by certain bacteria and soil fungi.

Nitrification is the breaking down of this ammonia, accomplished by two very important sets of soil bacteria—the *nitrite* and the *nitrate* bacteria. One group converts ammonia into nitrites; another changes the nitrites into *nitrates*, the only form of nitrogen which green plants can use directly.

Fixation of nitrogen from the air by bacteria. The air is made up largely, nearly 80 per cent, of nitrogen. If green plants could use this nitrogen directly we would not need to use sodium nitrate from Chile nor to employ other expensive means of nitrogen fertilization.

There are, however, two general groups of soil bacteria that have the power of taking the free nitrogen out of the air and "fixing" it, by changing it to nitrates and possibly other nitrogen compounds.

One group constitutes the "*legume bacteria*" (*Pseudomonas radiculicola*) of which there are said to be six varieties (the alfalfa—sweet clover, the clover, the vetch—garden pea, the cow-pea, the soybean, and the garden bean bacteria), which grow on the roots of plants of the legume family, in tiny swellings called "root-tubercles," or "nodules." These will not grow well except in soils which are sweetened with lime and well aerated. Further, the application of gypsum (calcium sulphate) to soils seems to have a remarkable stimulating effect on these legume bacteria, causing an increase, sometimes, equal to 100 per cent, and causing the number of root nodules to be greatly increased.

The second group of nitrogen-fixers live free in the soil, not associated with the roots of plants. These bacteria are often called *Azo-bacteria*, and the process of nitrogen-fixation *Azofication*. There are two kinds of these Azofiers: one which lives under conditions of poor aeration (the anaerobic species), and one which requires plenty of air (the aerobic species) and called *Azotobacter*.

The harmful organisms of the so-called "sick" soils in greenhouses are thought by Professor Russell, of the famous English Rothamsted Experiment Station, to be protozoa, such as the amoeba and other forms of minute animal life, which he says apparently destroy the useful bacteria.

Also may be classed as harmful, the so-called "*denitrifying*" bacteria, which flourish in water-logged soils from which the air is largely excluded, and which destroy the nitrates which plants require and thus allow the escape of valuable plant food in the form of ammonia and nitrogen gas.

Some of the soil-decay organisms are the main cause of the *acidity* of low-lying fields, of swamp and muck lands. In fact, cultivated soils in general tend to become more and more sour, due to the accumulation of the more inert humic and other organic acids and the more rapid removal by drainage of the lime and other bases. Or, the use of acid phosphate and similar fertilizers also is said to cause an increase in soil acidity. Lime (calcium carbonate—ground limestone; or calcium hydroxide—slaked lime) is used for the purpose of sweetening such acid soils.—*E. W. Olcott in Brooklyn Botanic Garden Bulletin.*

A Lesson on Weeds and Their Control

With Some Points Upon the Value of Crop Cultivation

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

WHILE it may be a practical impossibility to eliminate weeds entirely from our gardens and farms, their existence, to the extent which is too frequently seen, is the result of neglect.

As with many other troubles, prevention is better than cure, and the old proverb, "One year's seeding makes seven years' weeding" errs, if at all, only on the side of being too conservative. For this reason we frequently have to fight the incubus of the past, and it is easy to know in looking over a garden whether weeds have been allowed to seed on it in the past or not.

While the point holds good in all gardening matters, in nothing is the continual expert planning and care year after year by the same individual more productive of good results than in connection with weeds; but the cumulative benefits of years of care may be entirely lost by one year's neglect.

The greater part of the trouble with weeds is brought about by the too prevailing idea that when the cropping season is over in the Autumn the garden may be left to care for itself, with the result that the ground is well seeded for the weed crop of the following season. There are many matters of vital importance connected with Autumn gardening, of which not the least is the prevention of weed seeding. Neglect of this at any season makes the task of eradication simply terrible, and in the meantime, every crop on the ground will suffer. No system of garden management is more wasteful and expensive than that of laying off men early in the Fall and of neglecting the garden during that season. While no real gardener will, if he can help it, allow a weed to go to seed upon his place at any season, the seeds which fall upon the ground in the Autumn will not germinate as a rule until the following Spring, so that there will be no opportunity to kill the resulting seedlings until the crops are growing in the Spring. Neglecting gardens in the Autumn, and of course at any time, is always an extravagance, as the removal of the results of such neglect is more costly than the preventing of such results from coming into existence.

The importance of keeping weeds in subjection can not be emphasized too strongly in connection with both farming and gardening. Weeds damage crops in many ways. They deprive crops of moisture, plant food and sunlight. Even on exceptionally rich soil with plenty of moisture the detrimental effects of them is equally as great as under reverse conditions; this is most likely due to their toxic effects, the roots of weeds giving off substances which are poisonous to the plants we are cultivating. A still greater reason for their harmful effects is that their roots interfere with the root development of the roots of the cultivated plants.

It does not appear necessary to discuss at any length the question, what is a weed? Most people know them only too well, although there are some self-styled gardeners who are unable to distinguish weeds from other plants, and who in weeding a garden frequently root them both up. A weed has been defined as a plant growing in the wrong place; as, for example, a potato growing in a rose garden would be treated as a weed. Another example of a plant being in one position extremely valuable and in others a most noxious weed is to be found in the perennial Southern Wire Grass (*Capriola dactylon*), which is most difficult to control and eradicate among cultivated plants, yet at the same time is one of the most valuable plants for pasture and without it some of the Southern pastures would be almost worthless. However, generally speaking, plants popularly known as weeds are those which are wild and indigenous to the district, and which come up among cultivated crops.

Some idea of the nature of a soil may be gathered from the species of weeds common to it. To give two examples; where Sheep Sorrel (*Rumex acetosella*) is present in any quantity we may be sure the soil is acid and that lime is needed, while the prevalence of Horsetails (*Equisetum p.*) points to the necessity for subsoil drainage. It does not, however, necessarily follow that lime and drainage may not be required when these weeds are absent.

Weeds, even under conditions which are more or less adverse to other plants, are able to maintain their existence mainly because they are indigenous to the district. Some weeds produce immense quantities of seeds, which mature in most cases in a very short time and upon the weed plants even if cut when they are only just coming into flower; some have seeds

which are difficult to separate from crop seeds and are therefore frequently introduced with the latter; some possess roots or root-stocks that are perennial. Weeds persist, therefore, because they are well equipped by nature in one or more ways to more than hold their own in the struggle for existence. The remarkable vigor and prolificacy possessed by weeds would enable them to soon overcome most cultivated plants but for the aid of the cultivator, and it naturally follows that prompt, efficient, and persistent efforts are essential to their control upon cultivated grounds. Many people do not realize what an enormous number of seeds are produced by weeds, the number varying with different species from several hundreds to twenty or more thousand seeds per plant. Moreover, in any season of the year, these seeds, if allowed to fall upon the soil, do not all germinate at once, but delay germinating for a period which may extend over several years, hence the previously mentioned old saying, "One year's seeding makes seven years' weeding."

Like other plants, weeds may be divided into three classes with reference to the period of their natural life: annual, those which live but one season and which die as soon as they have produced seed; biennial, those that live two years, growing rather slowly the first year, producing usually a tap-root and a rosette of leaves close to the ground, sending up flower-stems the second year and then dying. Naturally this class produces seed only upon ground which has been left undisturbed for at least two seasons; and perennial, those which live an indefinite number of years. These last produce underground parts which live over after the tops have died down, spread in the soil and produce new growth the following year. They are therefore the most tenacious of life and are the most difficult to eradicate when the soil has been allowed to become infested with them, as in most cases the smallest piece of their roots will, if left in the soil, produce a new plant. The underground parts are of various kinds; they may consist of long, creeping, more or less horizontal, roots, as in the case of the Canada Thistle; or the underground parts may consist of root-stocks or underground stems, as in the cases of quack-grass and morning glory. These parts may also consist of bulbs which increase by splitting up, like the wild onion; or they may be more or less in the form of tap-roots, as with the dandelion. Obviously a knowledge of the life history of weeds will assist us in carrying out intelligently the most effective measures of control and eradication.

In considering methods for the killing of and clearing the ground from, weeds, we must first remember that it is far more important to avoid having weeds to kill, and the aim should be to prevent rather than to cure the evil.

The annual and biennial classes may be considered as one, and soil may ultimately be made practically free of them by not allowing weeds to seed upon it, and in preventing weed seeds from being brought in on to it. While the former is easy, unfortunately the latter is to some extent at least, not entirely possible.

If we do not allow a single weed to seed upon our own ground, seeds may be blown in from the gardens of less careful neighbors, from waste grounds and roadsides, they may be brought in among cultivated plant seeds and with stable manure. While all these possibilities militate against the probability of possessing a garden upon which weeds never appear, yet, all together, the resulting weeds from them is never one hundredth part as great as those arising from weeds seeding themselves upon the ground itself.

The first step in killing weeds arising from seed is to kill them before they appear.

There is always an interval of time in the case of all seeds between the commencement of the process of germination of a seed and the appearance of the resulting plant upon the surface. The continual cultivation of the ground between crops and individual plants without waiting for the weeds to appear, is the only way to approach, what every gardener should strive for, a weedless garden. An hour's sunshine will destroy freshly germinated seeds when exposed to it, while it might require more than a day to kill weeds which have been allowed to grow to any size and in the meantime rain could possibly cause them to root again. To arrive at and maintain that condition of cleanliness which is the attribute of a real garden, it will obviously be necessary to pull weeds by hand from positions that

the implement cannot reach. In cold, wet seasons, weeds will generally appear before the crop seeds we have sown, and if they are allowed to persist for any length of time will materially retard the growth of the plants we desire. Hand-weeding along the rows, &c., should therefore be commenced as soon as the weeds are large enough to take hold of by the finger and thumb. To facilitate this, should the crop seeds not have completely germinated, the rows should have been correctly marked at each end at sowing time so that if hand weeding is necessary before the crop comes up, a line can be stretched along them. This line would also be of assistance in cultivating between the rows without waiting for the sown seeds to appear. Hand-weeding is best done soon after rain while the soil is soft and moist, and before the ground between the rows is dealt with; when the ground is in that condition we can pull out weeds without disturbing plants.

The control and eradication of perennial weeds, or root-weeds as they are sometimes called, presents a somewhat different problem. Although these may of course arise from seed there is no excuse for their continued existence in a mature state in a garden, as it takes several months for seedlings of these to make much underground growth, and several years to reach the large tufts and masses which are sometimes seen. The gardener is not, however, responsible for these weeds when he takes over a legacy of past neglect, or has to make a new garden upon land already infested with them.

Quite often these perennial weeds are not only kept in the garden but encouraged to spread by the method pursued in handling the soil. It would appear to be a foregone conclusion that weeds which spread by their roots must increase rather than diminish by the practice of breaking up the tufts or pieces of the roots and turning them under during the operation of spading. In carrying out the latter the operator should have a basket or some container with him in which he should put every piece of the roots of these weeds he comes across. If this is always done carefully it will not be long before the soil can be entirely cleared from them. Thoroughness in the removal of the roots of perennial weeds is of the utmost importance if we desire to eradicate them, and it is better to confine one's efforts to a portion of the garden at a time and finish it, rather than to only half clean the whole, as the latter method does not forward any. Spading-under these root-weeds only hides them from sight temporarily, and they will soon reappear stronger than ever.

Cleaning the ground thoroughly is of special importance before planting perennial things such as shrubs, herbaceous plants, berries, bush fruits, asparagus, and such like. If the smallest part of the roots of these weeds is allowed to remain it will not be long before the roots of the plants will become intermingled with a mass of the roots of the weeds and their separation becomes impossible. Almost all the perennial things above mentioned will, if properly planted and cared for afterwards remain in a flourishing condition for a person's lifetime, it appears therefore to be an extremely wasteful policy to plant them in foul soil with the certainty that in most cases they will be smothered out by weeds in a few years.

If we prevent absolutely any top growth arising from these perennial weeds, their roots will sooner or later die. While the top growth of any plant cannot go on unless it has roots, the latter cannot live for any length of time without top growth to support them, although the roots are generally the more tenacious of life. Therefore if we do not allow any growth from these root-weeds to appear at all, they will sooner or later die. In this connection it must be borne in mind that if top growth is allowed to persist only for a day, the roots will have, even during that short period, received new life.

An effective method of destroying root-weeds without much labor, is to cover the entire ground with builder's tar paper, weighting it down with earth, stones, or anything that will keep it in its place, taking care that there is sufficient to overlap to prevent light from entering or the weeds growing through, between the strips. This would require to remain in position for two or three months during the growing season. Before placing the paper in position the weeds should be cut off close to the ground.

A problem of another character is presented by a weedy lawn. Here, too, its existence is the result of bad work when the lawn was made, of subsequent neglect, or of both.

In making a lawn, while some annual weeds will invariably appear which subsequent mowing will readicate, perennial weeds should be thoroughly cleaned out before sowing the lawn seed. If the latter is of the best quality it will contain no weed seeds, and the subsequent appearance of perennial lawn weeds, like plantain and dandelion, will have been caused by seeds of them coming in afterwards. If the ground has been well enriched and entirely covered with a thick stand of lawn grass there will be no weak or bare places upon which these weeds can get a foothold.

Plantain can be killed by cutting it off just below the surface of the ground, but dandelion should have the whole of its root removed. Neither of these weeds spread by their roots so each plant arises from seed. In thick strong grass, seeds are not likely to germinate. Places from which these weeds have been removed should have some fertilizer—sheep manure is good—applied and lawn seed sown upon them. This is best done in early Spring or Fall. Lawns which have been properly made, well fertilized each year, and cut with sufficient frequency, are rarely troubled with weeds, as the strong growth of the grass will prevent them from coming into existence.

Preparations for killing plantain and dandelion on lawns without killing the grass are sold, their active ingredients being sulphate of iron and sulphate of copper. The reason why these weeds are killed and not the grass is because they have broad leaves lying close and flat to the soil, the powder covering them and also falling into the hearts of the weeds; while it does not remain upon the grass by reason of its narrow leaves and upright growth, except to a very limited extent, and the slight browning effect of the powder upon them is soon recovered from.

One of the most pernicious weeds upon lawns, especially of recent years, is Crab Grass, (*Syntherisma sanguinale*), an annual which produces its seed in great volume and so close to the ground that the lawn mower cannot reach it. Further, it spreads by rooting at the joints, and upon weak and badly cared for lawns will soon entirely kill out the lawn grass. Prevention is attained by the means noted above for other weeds. When it exists, removing it by raking it out thoroughly and continuously with a sharp iron rake, adding lawn seed and fertilizer as the work proceeds, is the best way of controlling it.

One cannot emphasize too strongly the fact that the remedy for all lawn weeds is to secure a strong growth of lawn plants so that they can be victorious in their struggle for existence against the weeds.

Weeds upon walks are best controlled by the use of some reliable arsenical herbicide which, if thoroughly applied under right conditions according to directions sent out, will keep walks free from weeds during the entire season.

Obviously our remarks apply to gardens. While the underlying principles of weed control are the same in connection with farming and truck growing, their application will naturally differ; which differences space will not now permit us to discuss. In any case the loss and bad effects of allowing weeds to exist are the same. As regards farming, an expert of the United States Department of Agriculture has recently written: "It is difficult to estimate the damage wrought by weeds, but it is probable that they directly cost the American farmers several hundred million dollars every year."

In common with many other bad things, weeds are not an entirely unmixing evil. Bailey has stated, "It would have been a sorry thing for agriculture if there had been no weeds. They have made us stir the soil, and stirring the soil is the foundation of good crops. Even after we have learned that crops are benefited by the stirring of the land, we are likely to forget the lesson, or to be neglectful of it unless the weeds constantly remind us of it."

It is not uncommon to hear the expression, "I see my garden is getting weedy, I must get the hoe busy," the inference from this remark being that if there were no weeds the hoe would not be used. If the best results are looked for the necessity for continual cultivation between plants is just as great whether weeds exist or not.

Constant surface cultivation promotes soil ventilation. The soil needs ventilation. The roots of growing plants and the decomposition of organic matter in the soil tend to constantly exhaust the latter of its free oxygen and to replace this by carbonic acid which is not used by the roots, although it is by the leaves. Hence without some interchange of air between the contents of the soil cavities and the atmosphere above, the roots are retarded in their growth, and if this interchange is entirely prevented for any considerable length of time, the roots sooner or later become smothered and perish. In a sufficiently porous soil, changes in temperature and in atmospheric pressure, aided by wind and rain, furnish the needed soil ventilation, but in poorly-drained soils and in soils not thoroughly and frequently stirred, the roots of plants often suffer from insufficient oxygen. Therefore, we should never allow the existence of a puddled crust upon the surface, due to the compacting influence of rain, to remain any longer than possible. The best practice calls for crop cultivation after every rain.

Then again, one of the requirements for nitrification is an adequate supply of oxygen. The nitrifying organisms require oxygen for their existence, therefore in the entire absence of oxygen nitrification cannot go on, and also, therefore, the formation of a hard crust upon the surface of the ground checks nitrification.

(Continued on page 258)

Departments of Foreign Exchange and Book Reviews

FRANCE

The Devastated Regions.—Horticulture would appear to have been given not so great a blow as agriculture proper in the districts overrun by the invaders did one not know the part it has played where the sun, too often veiled, has been replaced by artificial heat, for the environs of Lille, the largest city close to the Belgian frontier, were the center of the country's forcing industry. This was naturally practically annihilated and years will be required to reestablish it. Field culture, however, has already been restored. But in the departments of France actually devastated the climate encourages little trucking with the exception of that done intensively near the larger centers of population. On a large scale the gardening was confined almost exclusively to the raising of legumes, save in the valley of the Aisne where a more clement climate ripens the grape. In the province Nord, of which Lille is the metropolis, however, along the coast around Dunkirk, where the sand has been manured, only currants and plums in addition to legumes are produced.

The taste of the wealthy manufacturers of the Flemish capital and of other towns in southern Belgium so populous stimulated the growing of fruits and vegetables under glass. Not far from Lille six establishments grew strawberries and tomatoes under 13,000 square meters, or $3\frac{1}{2}$ acres, of glass; five grew grapes, peaches, cherries, figs and other fruits, quantities of them, for Paris, under 50,000 sq. m., or $13\frac{1}{3}$ acres. Still more space of the kind, namely 70,000 sq. m., or $17\frac{1}{4}$ acres, was devoted to house plants like palms and araucarias. Besides there were "local" establishments, naturally abundant among a population of this kind. Grapes were enjoyed fresh from the middle of November to the end of June, peaches for three months and strawberries also. The southern part of this province grew quantities of apples and around one town over 12,000 acres were covered with orchards.

The other "liberated" provinces had less importance agriculturally than Nord. In the Somme was a great market-garden center that supplied not only its chief city Amiens but a large part of the province to the north also. Horticulture in this aspect has not suffered so much and is more quickly and more easily rehabilitated.

But the loss at Laon, south of Lille eighty miles, where the forcing establishments are comparable to those of the latter city, was very great. Here, and at Valenciennes in Nord also, was an especially interesting industry, that of cultivating medicinal herbs. Before the war the harvest was sometimes 50,000 kilograms, or over 110,000 pounds.

In La Marne were grown almost exclusively the usual legumes, especially around Reims, the most considerable market of the Champagne. The hills not far from Chateau Thierry, were covered with cherry trees that supplied the trade with Paris and fed a preserving factory.

More toward the east nothing remarkable horticulturally is found other than the extensive vegetable gardens at Luneville, southeast of Nancy, and the preserving works at this latter town and elsewhere, supplied with plums and other fruits, some of which were converted into brandy.

All these industries of course are bound in time to regain their importance, for the local needs will be no less than before and the difficulties of transportation from the south, and the cost of it, will not permit the bringing in from the distance of such quantities of fruits and of legumes as were imported before.

Alsace.—Alsace has long been a country of gardeners. There were guilds of market gardeners as far back as the XIII century. Strasburg is girdled by villages, on rich alluvial soil, nearly all of whose 40,000 inhabitants make their living by trucking. Floral festivals are regular institutions. Fine estates with well-wooded parks occupy many of the suburban regions. The Orangery is one of the most beautiful public gardens of Europe. The soil is particularly adapted to the growth of trees and this, with the horticultural tradition, made the vicinity, before the German seizure, one of the world's great nursery centers. But the ban upon the French language drove many of the old gardeners from the country. The progress of horticulture furthermore was retarded by the German policy of sending in young gardeners trained by study and practice in the schools associated with botanical gardens in various parts of the empire and who acted as propagandists of their native country's institutions. The appeal is now going forth for all-round training to be offered at

the metropolis and at other centers to young French boys who are heirs of the tradition not entirely eradicated by foreign usurpation.

Lorraine.—This, like its sister state, also is a natural horticultural center. In fact it was gardeners from this province that several generations ago introduced into Germany the taste for the cultivation of fruit trees. Hither resorted many young men from the Sarre region and the Rhenish provinces to serve their apprenticeship. Now, since the armistice, many of the ancient families have returned to take possession of their ancestral estates. But owing to the scarcity of labor some time must elapse before there is restored to the noble estates their pristine splendor. They fell into considerable neglect during the long German occupation when the government gave little encouragement to horticulture in any form. Throughout the great war the neglect was absolute. Recovery has begun, however, and the botanical garden of Metz, with its interesting collection of trees, notably the exotic, is again going to supply the public parks and gardens with stock to the production of which it used to be largely given.—*Condensed from Revue Horticole, Le Jardin and Vie a la Campagne.*

AUSTRIA

There is no necessity for explaining that horticulture as a whole is badly affected by the present economic and political situation in this country. Austria has not only lost a long and exhaustive war, she has lost much more by peace. German Austria is reduced to a poor, small country with few natural resources, and surrounded by states that are none too friendly with her. The worst, however, is the fact that each little "land" within the narrow limits of the present republic acts in the most selfish way.

I resided in the U. S. A. during the war, because I was on an exploring trip in western China when the war broke out, and not being able to go back to Austria, I accepted an invitation from Prof. C. S. Sargent to go to the Arnold Arboretum at Jamaica Plain, Mass. Therefore, when I came back to Vienna in October, 1919, I perhaps, more deeply felt the contrast between the past and the present than anyone who had remained during the past five years, and had become used to the misery.

Vienna has always been the centre of horticulture interest in old Austria, it is even more the centre to it at present. But, what a change! The beautiful city, once the meeting place for all who went to central and eastern Europe, is still beautified by gardens full of Lilacs, Forsythias, Irises, and other lovely flowers, but about all parts famine is lurking, and far too many pallid-faced children and worn-out mothers are to be seen.

The main impression is that everything (I might say everybody) needs repair. Everybody is so exhausted by the war and its evil consequences as to have lost the energy necessary to keep up the struggle.

Some of the gardeners, of course, are by no means badly affected by the present situation. Many of the market gardeners have become well-to-do men. They sell their few vegetables at prices undreamed at any previous time, because there are a few rich men, too, who can pay for them. But the people as a whole are not able to buy lettuce, spinach, or cauliflower at the present rates. The case of the florist is, to a certain degree, different. Scarcity of labor and very high wages, combined with the high cost of fuel, wood, glass, and every other material he needs for keeping up his establishment, make it impossible for him to maintain his former standard and even difficult to grow what is needed today.

Vienna has been famous for its beautiful gardens, but these are beginning to disappear. The public gardens are kept fairly well by the city, and in this extremely lovely and warm Spring, the private gardens and suburbs look much finer than they really are. The work of the landscape-architect is restricted. Where, formerly, he planted handsome flowers and shrubs, there are now growing lettuce, cabbage, potatoes and other useful things. The number of war-gardens is immense. Hundreds of colonies of what are called "Schreber" gardens have sprung up, and the Schreber-garden movement is one of the characteristic features of the time.

The situation of the Horticultural Society is a rather lucky one. It was in possession of a valuable piece of ground in one of the best parts of the city, but it has sold part of it during

the war, and now has some money at its disposal. But it cannot realize its intention to build a new home, because no houses at all can be erected at a time when one brick costs about 3 crowns. The society has a garden of its own at Esslingen, about two hours from the city, in the so-called Marchfeld, but at present it is not much more than a vegetable garden. It will take some time to transform it again into a real experimental ground.

The former *Obstbau-und Pomologen-Gesellschaft* has been united with the Horticultural Society, which tries to do its best in helping the reconstruction of horticulture in its broadest sense in German Austria—Camillo Schneider, Vienna, April 21, 1920 in the *Gardeners' Chronicle of London*.

Lilium candidum can easily be propagated from scales. Take up the bulbs in July and leave them exposed on a bench in the greenhouse for a month or two for the scales to become limp and easily detached without breaking. At the beginning of September put them into a box of finely-sifted leafmold and sand, standing them upright and just covering them with the soil. By the middle of January of bulbets will have formed at the base of the scale.—*The Gardeners' Chronicle of London*.

Double-worked or top-grafted apples, even when grafted upon upon free-fruited kinds, seem always to yield much less than a normal crop, though they bear finer fruit. If it can now be established that top-grafting gives lighter crops and larger fruits it is probable that scions from varieties that are liable to over-production and to bearing small fruits might become free from the annoying, alternate-year bearing habit which is characteristic of some varieties and which cannot in all cases be prevented by severe thinning of the crop.—*The Gardeners' Chronicle of London*.

Fruit trees on walls often fail because of lack of moisture at the roots, especially at south walls and where the borders are raised. They should be given a mulching of partly-decayed manure and a good drenching. If they are treated in this way and the roots kept moist the red spider and most other insect pests rarely appear.—*The Garden*.

All Gage plums have the reputation of being shy bearers, possibly because they are unable to ripen their own pollen. Pond's Seedling and Czar, which one authority advises should be planted in connection with the Gages, have not helped. Would the need be met by grafting a branch of a different variety upon each tree of the Gage? *The Elementary Handbook of Fruit Culture* by Bunyard and Wilks recommends only standard plum trees and declares that all dwarf plum trees are as a rule unsuccessful unless root-pruned every other year.—*The Garden*.

Plum trees need protection from the wind, for their tender blossoms are produced upon absolutely naked shoots and branches. The case is all the worse with the more delicate varieties, because they flower earlier than do the more hardy kinds.—*Gardening Illustrated*.

Blue Hydrangeas—To turn the flowers of Hydrangeas blue, growers use a teaspoonful of sulphate of iron to each peck of soil when potting, and a teaspoonful to a gallon of water when the pots are filled with roots. Another plan is to use half an ounce of ammonia alum to the gallon of water, twice a week, and continue this till the leaves fall.—*Garden Life*.

Dicentra eximia.—For associating with Ferns in a cool, shady place, this is very useful, and though not nearly so showy as its relative, *D. spectabilis*, it is much more reliable for the open ground, as it is not so likely to be damaged by early frosts. It has a very long period of flowering—something like four months if it is not allowed to get parched—its red flowers wonderfully pretty in their setting of tender, green, Fern-like leaves. There are few more accommodating or satisfactory plants when its few simple requirements are attended to. It is increased by division with the greatest ease and is an ideal town garden subject.—*Gardening Illustrated*.

Destroying the stumps (W. Renton).—The following is said to be a good recipe. In the autumn bore a hole 1 inch to 2 inches in diameter and 18 inches deep, put in 1½ ozs. of saltpetre, fill with water, and plug up close. In the following spring put into the same hole ½ gill of kerosene, and then light. The stump will smoulder away without blazing and leave nothing but ashes.—*Gardening Illustrated*.

Culture of the Bearded, or Flag, Iris.—The cultural essentials are practically the same for all the "Flag" Irises. All the members of this section are sun-lovers. Certain of them may

do in partial shade for a time, though in such positions they presently decline, and refuse to flower. As to soil, they like a light, well-drained loam, and are often quite happy in stony ground and on calcareous soils. They are particularly partial also to lime, and an application of lime to a limeless soil usually tends to improve them. Clay soil should be improved by adding sharp grit, light soil, or old mortar screenings—anything, in fact, of a nature calculated to improve drainage, and introduce soil best suited to their well-being. Failing the old mortar, a dressing of lime should be given. In planting, keep the rhizomes (root-stock) practically level with the surface.—*Gardening Illustrated*.

A prominent nursery company of London has this as part of its advertisement in *The Garden*: "We have been carrying out experiments for some years as to the best time to plant the Flag Iris, and we find that when performed after the flower has gone they do better than any other time, flowering well the next season."

A gold medal has been awarded by the Rose Society of England to Rev. F. Page-Roberts, a beautiful H.T., recommended for exhibition and for garden decoration. It is a full bloom, with much of the *Marchal Niel* form, good both in bud and fully expanded. The yellow color varies from a good clear shade to deep orange, flushed with apricot, and is nearly always light at the tips. The blooms are pleasantly fragrant. Shown by Messrs. B. R. Cant and Sons.—*The Gardener's Chronicle of London*.

Grafting the Lilac.—In an article on "Lilacs" great stress is rightly put on the advantage of obtaining the different varieties on their own roots. Time was when it was practically impossible to obtain any but grafted plants in the case of the named varieties. Not only were they grafted on to seedlings of the common Lilac, most prolific in the production of suckers, but the Privet was often used as a stock. Complaints of non-success with grafted plants were so numerous that a crusade against unnecessary grafting set in. It in time bore such valuable fruit that it is now possible to obtain the several varieties on their own roots. One of the first to issue ungrafted plants was M. Lemoine of Nancy. His new varieties were at first grafted but after a while plants on their own roots were substituted. Another method of increasing the Lilac is by means of cuttings. The easiest to strike are the soft shoots produced by the plants that have been forced into bloom. These shoots should be taken when they have lost their extreme succulent character, and if dibbled into pots of sandy soil and placed in a close propagating case where a gentle heat is maintained, they will soon root. Cuttings of the half-ripened shoots, taken from the open ground, will also strike in a frame kept close and shaded.—*The Garden*.

Lilac hedges.—Few Summer leafing shrubs form more charming hedges in early Summer than Lilacs. The only pruning required is thinning out the longest straggling shoots annually, so as to keep the base well furnished with young growth. Hedges of this kind should not be clipped, as in that case most of the bloom would be sacrificed and a stiff, formal aspect imparted to them which would rob them of half their beauty.—*Gardening Illustrated*.

Unightly Hedges.—Bareness at the base of hedges is distinctly unsightly. There are three methods by which such bare hedges may be improved: first by cutting the hedge now hard back to within 9 to 12 inches of its base, thus starting it afresh; or, secondly, if space permits by planting young plants in between (they will then require much attention to watering in the first season); or thirdly, by cutting down to within 6 inches of the ground every alternate or third plant. The last is the best of the three methods, because the hedge remains practically intact and the stumps break rapidly into growth just now. If this growth is topped once or twice during Summer, it will lay the foundation for a thick bottom. The top, by careful clipping or cutting, may be induced to become as thick as before in a few years; a splendid hedge will result.—*Popular Gardening*.

The Use of Fertilizers in Counteracting Adverse Climate.—The *Journal of the Ministry of Agriculture* draws attention to the value of artificial manures in mitigating adverse effects of climate on crops. Thus in districts with light soils where drought is to be feared, the use of potash manures, by causing a prolongation of vegetable growth, enables a plant to stand up better against the drought. Phosphatic manures, on the other hand, effect the more rapid maturing of crops, and hence are specially useful in districts where heavy rainfall is to be anticipated.—*The Garden*.

BOOK REVIEW DEPARTMENT

The Practical Book of Outdoor Rose Growing, by George C. Thomas, Jr., second garden edition; cloth, 8vo, 224 pages, with 17 colored plates, 30 illustrations in a half-tone, charts and an index; the J. B. Lippincott Company, Philadelphia.

Devotees of the Queen of Flowers have great cause to rejoice in there having just appeared, to cover the latest discoveries to the moment of going to press, this completely rewritten book so unique in its being the fruit of a wealthy man's devotion of talent pregnant with genuine impartiality and authoritativeness. The Summer after his return from service in the country's army has been given, with increased enthusiasm, to tests and to studying points of improvement in cultivation. It is from such circumstances that has sprung this work that may truly be said to approximate the ideal, if it is possible to conceive of ideality in the case of a book, and that will be all the more appreciated as it is probably to be the last of its kind to be expected from the man who has done so much for the flower and for those who love it and cultivate it. In his new home Captain Thomas will grow the rose under conditions more favorable; but his help will be sorely missed by those of us, in various parts of this great country, who have profited by his testings of new varieties in climates and situations more difficult to contend with than those of southern California. That the author's book has been useful in this regard is proven by his own words that everybody knows are true: It is difficult to find roses well suited to our climate. The Winters are more severe and the Summers hotter than the conditions to which imported roses and their forebears have been accustomed, so that many of the roses which flourish in Europe are worthless with us.

Besides judging the bloom and the season and freedom of their being produced his tests have comprehended careful investigation of habit and growth made by own-root plants compared with those budded on sundry stocks. How much study has been necessitated by the rather remarkable developments of the last few years is indicated by the fact that his pet list of the "sixteen best all-round varieties" selected in the fall of 1914 he has changed and expanded into a list of forty-eight that "have stood out as the best," twelve in the lighter shades, twelve in the pink, twelve in the red and twelve in the yellow, each dozen being individually arranged according to his preference. That the list is not in the least incautious is evidenced by the omission of Premier and Madame Butterfly and even Los Angeles and Columbia, on the ground of their having not yet been sufficiently tried out. These do not occur at all in his Main List either, although this includes, as Class 3, special roses for large gardens or collections. Is not this conservatism too extreme and might not the author have perhaps better relied in cases like those upon the opinions of other trustworthy experts and even have visited other plantations? In the national garden at Arlington, for example, has been growing for now several years, a climbing rose, Bess Lovett, which in every respect except strength of cane is far superior to Climbing American Beauty; and it is already in commerce. Near it grows a companion of lighter color, Alida Lovett, which though not yet available to the trade, also might well be recognized in a work like this, particularly in the interesting and valuable chapter Rose Development from 1917 to 1920. In this chapter also, by the way, is the only misprint that the reviewer has detected, in *Red Reliance* for *Red Radiance*. To this rose the reviewer wishes also that more attention were given, for he considers it the finest bedder he has learned to know.

But to take such exceptions is invidious. So too would it be to call attention to little shortcomings that other readers might never become aware of. Instances are: the omission in the index of Hedges; in the Score Card of points that in detail would set forth the habit of the plant and its appearance as a whole in the garden; and, in the body of the book, of a treatment of roses for different sites, like that given to the *rugosas*. For this last item, however, the author would have to go somewhat outside his own experience. If he had confined himself to the Main List of Roses alone, with its amazing and wonderful detailed description of one hundred and sixty bush roses, with a record of their performing, so concise and accurate and yet satisfactory, he would have placed the rose world under great obligation. The publishers also deserve gratitude for having co-operated so splendidly. All readers of this lovely garden edition might well wish to obtain the new fifth edition *de luxe* also with its superb pictures, in natural colors, of one hundred and four of the world's finest roses and forty-seven additional illustrations.

My Growing Garden, by J. Horace McFarland; 24mo., cloth; X111 + 216 pages, including an index and 32 plates in sepia and 5 in colors; the Macmillan Company, New York and London. London.

Wise old Cato once defined an orator as a good man skilled in the art of speaking. Similarly the successful author of a book on gardening, for from the time Adam was instructed to be a gardener gardening has been almost as natural and as universal an activity of man as speaking, must be a passionate and pure lover of the soil and of growing things as well as skilled in the art of expression. No other could compose this pæan of victorious accomplishment after striving, that in six years made of an abandoned vineyard at the edge of a town a notable garden home. It is eloquently poetical, almost lyrical, yet wise and most practical withal. It really tells how "the two acres of San Jose scale, with a house attached," with weeds in sight, and more weeds, in a little depth of shallow soil upon a heavy shale was, with but little help other than the co-operation of plant-loving friends, converted into a delightful and satisfactory spot where could be made to grow "every tree that is pleasant to the sight and good for food." It is a book that landscape architects might well assist in bringing to the attention of prospective home-makers. It is a book that all persons interested in civic improvement ought to help to disseminate. It would by most readers not quickly be laid down when once they began to read not only "how exquisitely beautiful the barbery hedge can become when it blooms in crystal," but also how simple and how rational it is to use manure and dynamite, to compost leaves and trash, to prune and to spray, to get after tree-borers, to cover grapes with paper bags, to have sweet corn at the kitchen door within a minute's reach for seventeen weeks of the year, while at the same time beauty is spread around as the result of sowing a few packets of flower seeds.

Good common sense is shown in estimating the desirability and worth of the different annuals and shrubs and trees. Fine taste is used in appreciating the flora of the home state along side of fairness toward commendable novelties. The generally excellent literary style has the climax in the chapters entitled *The Early Fall Glory* and *Choosing Your Own Weeds*. Evidence of scholarly carefulness and accuracy pervade; calling the cup-shaped tulip *Bouton d'Or* a Darwin and even the use of the phrase "*gladioli bulbs*" are errors perhaps easily pardoned.

The publishers and the author's own print-shop have certainly "made of the book much more than a perfunctory item of work." From the material point of view, as well as in its composition, the book is a work of art.

Gardens and Their Making, by Dora Williams; 8vo, cloth; IX + 235 pages, with index and illustrations; Ginn and Company, Boston.

This little book it would be well for readers of the *CHRONICLE* to urge upon the attention of parents and all who in any way are charged with the instruction of the young. The author reveals herself as a real and careful student of education, possessed of true psychological and pedagogic insight. She makes good her case in pleading that the garden as a workable laboratory should be "called upon to take its place in the scheme of education and to fulfil its social and scientific possibilities" by showing that its greatest lessons are lessons in the art of living and by describing, in an interesting and impressive manner, the incidental values to be gained from a well conducted school garden. But as a practical manual the work has defects and at points even misleads. In attempting to give advice about such simple matters as the making of a trench for the sowing of vegetable seeds it displays lack of sufficient practical experience. It is apt to cause the novice to believe that bulbs of tulips and narcissi need to be kept warm through the winter out of doors and fails to mention the necessity of preventing them from drying out when forming roots for blooming in the house. In treating of watering it seems to permit the applying of spray to foliage when the sun is shining upon it. This and, upon another page, the crowding of sentences that might persuade the youthful gardener to plant Holland flower bulbs in the Spring and then a little later to transplant them are exceptions to the general literary excellence of the book. The illustrations embellish; but as they serve no other purpose they might perhaps have been dispensed with in order to lessen the cost of the book.

School and Home Gardens, by W. H. D. Meier; 8vo, cloth; V + 319 pages, with 157 illustrations and index; Ginn and Company, Boston.

This is an excellent companion book to the preceding, for just as Miss Williams' work is well designed to stimulate an

(Continued on page 258)

Notes from the Arnold Arboretum Bulletin

JAPANESE AZALEAS.

THE flora of Japan contains many species of Azaleas, and in early Spring their brilliant flowers enliven innumerable hill-sides. Many species and varieties are favorite garden plants in Japan, and Japanese gardens owe much to these plants. In distribution the Azaleas of Japan are generally southern, and only a few species are found in the northern part of the empire. All of the species will probably flourish in the southern United States; and many of them will succeed as far north as Long Island and possibly in Newport, Rhode Island. Of the sixteen Japanese species three are well established and hardy in the Arboretum; a northern species, *Rhododendron* (all Azaleas are now called *Rhododendrons* by botanists) *Albrechtii* related to our *Rhodora* but with red flowers, judging by the climate of the region in which it grows, should also be hardy here. This handsome plant, however, which was first raised at the Arboretum twenty-five years ago, has not been a success here. Another northern species, *Rhododendron Tschonoskii*, with the smallest flowers of any Azalea, is an old inhabitant of the Arboretum but is still without value as an ornament of gardens. Two beautiful Azaleas from the mountain forests of central Hondu, *Rhododendron Rehderianum* and *R. pentaphyllum*, have not yet been sufficiently tested in the gardens of this country; they may be expected to be able to bear the cold of Massachusetts Winters, but appear difficult to establish. Another Japanese Azalea, *R. mucronatum*, generally known as *Azalea ledifolia* or as *Azalea indica alba*, has been seen in American gardens for the last eighty years. It is very often found in the old gardens of the southern states; it is hardy and often cultivated on Long Island, and occasionally lives for many years in sheltered positions in eastern Massachusetts. The three Japanese species, which have proved themselves, after a trial of twenty-five years, to be perfectly hardy and first-class garden plants in eastern Massachusetts are *R. Kämpferi*, now considered a variety of *R. obtusum*, *R. japonicum* and *R. reticulatum*, better known as *R. rhombicum*. The first of these plants is the only red flowered Azalea which is hardy in this climate. Thousands of seedlings have been raised in this country in recent years and it will soon become common in eastern gardens. It has been largely used in the Arboretum, and late in May and in the early days of June its flowers furnish the most surprising and spectacular display of the year. The flowers are delicate, however, and when fully exposed to the sun lose their color; and this Azalea gives most satisfaction when it is planted in the shade of trees or on the northern border of a wood of conifers. In the Arboretum the most successful group of this Azalea is behind the Laurels (*Kalmia*) and in front of the Hemlocks at the northern base of Hemlock Hill. The plants bloom a week later than those in more exposed situations and their flowers last much longer in good condition. The tallest plants in the Arboretum are now eight or nine feet high and although growing in complete shade never fail to flower.

Rhododendron japonicum has been growing in the Arboretum as long as Kämpfer's Azalea, and by many persons it is considered a handsomer plant. It is a round-topped rather compact shrub usually not more than three or four feet tall, with flame-colored flowers three inches across. It is only in recent years that the value of this plant in American gardens has been recognized, for it was long supposed, in the Arboretum at least, to be one of the numerous forms of the short-lived and usually unsatisfactory hybrids sent to this country chiefly from Holland and known commercially as *Azalea mollis*. A beautiful yellow-flowered variety of *R. japonicum* (var. *aureum*) has been found in Japan, and a few plants have reached the United States, where two years ago it flowered for the first time in a Massachusetts garden. This plant promises to be an important addition to the number of hardy Azaleas which can be grown in this climate. A handsome race of hybrid Azaleas was obtained several years ago in Europe probably by crossing *Rhododendron japonicum* with the yellow-flowered Azalea of eastern China, usually known as *R. sinense*. To this race of hybrids the general name of *R. Kosterianum* has been given. The best known plant of this hybrid origin is probably the one called "Antony Koster." It is a handsome plant, but not always entirely hardy in this climate where it is usually short-lived. About eight years ago T. D. Hatfield, gardener of the Hunnewell Estate at Wellesley, Massachusetts crossed *R. japonicum* raised from seeds collected by Professor Sargent in Japan with *R. sinense* raised from seeds collected by Mr. Wilson in eastern China. There can be no doubt about the parentage of this plant. This new Azalea, which has been named

R. Kosterianum, "Miss Lonisa Hunnewell" bears large clusters of orange-colored flowers which open as the leaves unfold; the plant is perfectly hardy, and the flower-buds were not injured by the exceptionally severe Winters of 1917-18 and 1919-20. If anyone in the United States has raised a handsomer shrub it is unknown to the Arboretum. During the last seventy-five years several hundred different hybrid Azaleas have been made in Europe and the United States; accurate and reliable records of the parentage of these hybrids, however, have not been kept, and published statements of their parentage are often mere guesswork. Certainly many of these hybrids have been obtained by crossing not only species but hybrids. This mingling of plants, themselves often of unknown or uncertain origin, has produced difficulties of determination which no amount of study will probably ever overcome; and of all hybrid Azaleas the parentage only of this Wellesley plant is really known, a fact which certainly adds to its value and interest.

Early-flowered American Azaleas. Before the flowers of *Rhododendron Vaseyi* have entirely faded those of the two most widely distributed species of eastern North America, *R. nudiflorum* and *R. canadense*, begin to open. These plants are common from New England to Texas; they have pink, very fragrant flowers which open before and as the leaves emerge from the bud, and very similar in general character, will perhaps sometime be considered varieties of one species. They have been planted in considerable numbers in the Arboretum and grow equally well in open borders or in the partial shade of woods. Before their flowers fade those of the flame or yellow-flowered Azalea (*R. calendulaceum*) of the Appalachian Mountains, the most splendid of American Azaleas, will begin to open.

LATE-FLOWERING VIBURNUMS

The Arboretum late in June owes much of its beauty to the late-flowering Viburnums of the northeastern states which have been planted here in considerable numbers. The first of these plants to bloom and the handsomest of them, *Viburnum cassinoides*, although it grows naturally in cold northern swamps, takes kindly to cultivation, and in ordinary garden soil is a handsomer and more shapely plant than it is in its natural home where it often makes slender straggling stems fifteen or twenty feet tall. The beauty of this Viburnum is in its ample, thick and lustrous leaves which vary in shape and size on different plants, in its broad convex clusters of pale cream-colored flowers and in its large showy fruit which when fully grown is yellow, then pink, and finally blue-black, the three colors often appearing at the same time in the same cluster. The fruit of *Viburnum cassinoides* is larger than the bright blue fruit of the other Summer-flowering species, *V. dentatum*, *V. venosum* and *V. Canbyi* which bloom in the order in which they are mentioned here. They are large round-topped bushes with coarsely toothed leaves and large clusters of white flowers; they are all good garden plants and respond to generous treatment with more vigorous growth, a better habit and handsomer foliage. There is a large collection of deciduous-leaved Viburnums in the Arboretum and there is now a good opportunity here to judge the comparative values of the plants from different countries, and this comparison shows that the flora of eastern North America contains more handsome garden plants in this genus than all the rest of the world. In Japan there are species like *Viburnum tomentosum*, *V. Sieboldii* and *V. dilatatum* which are beautiful garden plants, and the European Traveler's Tree, *V. lantana*, is one of the handsomest and most distinct of the early-flowering Viburnums which can be successfully grown here. In claiming the superiority of the American species for American gardens it must be remembered that none of these species have red fruit, which is produced by several of the eastern Asiatic species. The most successful of the red-fruited species in the Arboretum have been *V. dilatatum* and *V. Wrightii*. These should find a place in American collections, especially the former which is here a hardy, free-flowering plant of compact habit, which has few rivals in the beauty of its brilliant and abundant bright red fruit.

THE HORSE-CHESTNUTS

Aesculus georgiana is covered again with its compact clusters of large red and yellow flowers. The southern Buckeye has not been injured by the severe Winters of 1917-18 and 1919-20, and is certainly one of the best new plants which have been brought into our gardens in recent years. When first discovered it was

believed to be confined to the neighborhood of Stone Mountain in central Georgia, and to be always a shrub in habit, but is now known to range northward in the Piedmont region to North Carolina, and often to grow into a small tree. The oldest plants in the Arboretum are beginning to assume a treelike habit, and in the parks at Rochester, New York, *Aesculus georgiana* is a shapely small tree with a straight well developed trunk. Many other Horsechestnuts and Buckeyes are now in flower; and the large group of these trees and shrubs on the right hand side of the Meadow Road is just now one of the most interesting and attractive in the Arboretum.

Aesculus discolor var. *mollis*. This shrub or small tree has not before flowered so freely in the Arboretum. The type of the species has red and yellow flowers, but in the var. *mollis*, which is the only form in the Arboretum, the whole flower is bright scarlet. It is a common plant from northern Georgia to central Alabama and westward to the valley of the Guadalupe River in Texas, ranging west of the Mississippi River northward to southeastern Missouri, and appearing in southwestern Tennessee. In early Spring no other plant in the southern states is more brilliantly conspicuous, and its unexpected hardiness in New England is one of the important discoveries made by the Arboretum in recent years. There is a form of *Aesculus discolor* (var. *flavescens*) with yellow flowers which is confined to the Edwards Plateau in western Texas. It is possible that this plant may also prove hardy here. *Aesculus Harbisonii*, which is believed to be a hybrid of *A. discolor* var. *mollis* and *A. georgiana*, is the last of the Buckeyes, with the exception of *A. parviflora*, to bloom in the Arboretum. It is a shrub with broad clusters of large flowers with a rose-colored calyx and canary yellow petals tinged with rose toward the margin. Still extremely rare, this hybrid which is perfectly hardy deserves to be better known.

Berberis Vernæ. Gardeners often complain that there are now too many Barberries, and it is certainly true that only an expert who has devoted years of special study to the genus can readily distinguish all the species, varieties and hybrids in the groups of which *Berberis vulgaris*, the common Barberry of western Europe, and now naturalized in the northeastern United States, is a typical plant. There are now probably at least one hundred different Barberries in the Arboretum Collection and the number is likely to increase rather than to decrease, for Barberries hybridize easily in collections like the one in the Arboretum, and it is more than probable that China, the headquarters of the genus, may still contain undescribed species. There may be too many Barberries but no one who has once seen *Berberis Vernæ* as it is now growing in the Arboretum will regret that Wilson, who discovered this plant in China, sent seeds to the Arboretum in 1910 from the neighborhood of Sungtan in the upper Min Valley where he found it at an altitude of about nine thousand feet above sea-level, growing with the other Chinese Barberries. *B. Vernæ* is here now about six feet tall and nearly as much in diameter. The long, slender, bright red branches covered with small, nearly entire leaves arch and droop gracefully, and from them hang on long stems innumerable slender clusters of small, pale yellow, slightly fragrant flowers which in the Autumn are followed by small red fruits. A green fountain best describes this shrub. There are Barberries with larger and handsomer leaves, larger flowers and more brilliant fruit, but there is not one in this collection, at least, of such graceful habit; and *Berberis Vernæ* as it grows here is not only one of the most beautiful of the deciduous-leaved species of the genus but one of the handsomest of the shrubs discovered in China during the present century which can be successfully grown in this climate. Plants of *Berberis Vernæ* raised from seed collected by William Purdom in Min-chou in western Kansu, received at the Arboretum in 1912, are also well established here.

LESSONS ON WEEDS AND THEIR CONTROL

(Continued from page 253)

The adverse effects of drought can be materially decreased by cultivation. As cultivation prevents to a considerable extent the loss of soil moisture, cultivation may be made the means of eliminating to a great extent the necessity for artificial watering. When surface cultivation is practiced, the capillary spaces near the surface are destroyed and the direct connection of the subsoil water with the upper layer of the soil is broken; the ground is covered with finely pulverized earth and the soil particles have been so disturbed that there is not that close contact which enables water to pass from particle to particle. When evaporation takes place there is a movement of the subsoil water to the surface, but if the surface is covered with a layer of fine earth the subsoil water cannot readily pass through such a medium, and evaporation is checked. Therefore surface

cultivation conserves soil moisture. Hence, after a rain, soils should be cultivated as soon as the implements will work well, which, by preventing the formation of a hard crust, will check evaporation. An appreciable amount of moisture is returned to the soil at night when the moisture-laden air can penetrate it, as dew is formed in the soil by the cooling of the latter in the same way as it is formed upon the surface of leaves.

It is apparent that to obtain the best results there must be no let up in our efforts both with soil cultivation for its own sake and for the control of weeds.

Many people start the season with great enthusiasm; as the year advances, especially if the weather is more favorable to weeds than crops, they sometimes get discouraged. Ultimate success and the permanent welfare of a garden depend upon which has the greater persistence, the gardener or the weeds.

BOOK DEPARTMENT

(Continued from page 256)

interest in the subject and to inculcate appreciation of its importance so this is instructional and very practical, concise, clear and sufficient in every way. Used as the working manual for the Course of Study in School and Home Gardening, a course outlined by the author himself and printed in small pamphlet form for the eight grades of the public schools, it is a most serviceable volume. It wisely begins with the window garden and plants growing from bulbs, which are most attractive to the child and most easily managed. To several precepts, however, exceptions may be taken. There is a too general advocacy of manure which, unless applied with caution, is of course injurious to bulbs and to the roots of most plants. Trees ought not be planted two inches deeper than they stood in the nursery and allowance should be made for settling of the soil; nor should bearded irises be set four inches deep. A potato "about the size of an egg" usually has too many eyes to permit of its being planted whole. By dividing roses into the four classes *Rosa rugosa*, Perpetual roses, the Crimson Rambler (!) and Wild roses the author misleads, particularly as he states that those of the second class endure the Winter without any extra protection, although he names two Hybrid Teas in this class and confuses them and others with Hybrid Perpetuals. His advice about cutting back all the "Perpetuals" liberally so as to have but one-third or only one-fifth of last year's wood remaining in the Spring is not so bad, although the general practice, as is well known, is not to prune the Hybrid Perpetuals so severely. Some of the pictures are of questionable utility, notably the one showing peas planted in a double row; taken in conjunction with the text that directs the placing of the seed a half inch apart it might cause extravagance and a density of vines that would be stifling. But, notwithstanding, it is a good book and supplies a great need.

A MOONLIGHT GARDEN

HAVE you ever noticed how beautiful all white and pale-colored flowers look in the moonlight? It is a very interesting to plan a corner of the garden with a view to its effect when the queen of the night is sending down her silvery rays. In a moonlight garden which recently came under notice the list of flowers included the following:

In the early spring there were white hyacinths, narcissus, and tulips. Two small shrubs that at this season gave a wonderful wealth of white bloom were deutzia and spirea. In the borders of the beds there were sweet alyssum and candy-tuft. In one corner a patch of lilies of the valley showed up against the dark foliage. Most of these flowers give out the most delightful fragrance and, in the warm spring evenings, it was a joy to linger and breathe in the sweet scents.

A little later on the flowers in the moonlight garden increased greatly in number. Of course there were white stocks and tobaccos. Both of these glisten in the moonlight and, as well, give out the most delightful odors. Then there was a border of the old-fashioned snow pinks and also some white pansies. A clump of the exquisite Madonna lilies made a fine show in the moonlight. Close at hand there was a mass of white sweet peas. No one has any idea until he has seen them, how beautiful the dainty flowers look against the dark green of the foliage. In fact they closely resemble a number of graceful butterflies, disporting themselves in the soft night air. Groups of white foxgloves and columbines proved to be most effective, and both these plants stayed in bloom for a long while.

When there is no moon at all the white garden is still interesting. It is wonderful how well many of the flowers show up even in the darkness. Many of them seem to shine with a curious phosphorescence. No doubt this is to advertise their presence to moths and other night-flying insects on which they depend for pollination. Crowds of interesting moths of many kinds will visit the moonlight garden.—S. LEONARD BASTIN.—*Country Life*.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

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THE ANNUAL CONVENTION.

The local convention committee submits the following preliminary program for the annual convention of the association to be held in St. Louis, September 14, 15, 16.

Tuesday Morning: Meeting of executive board; **Afternoon:** Opening of the convention and business session; **Evening:** Annual banquet.

Wednesday Morning: Business session; **Afternoon:** Business session; **Evening:** Shaw banquet.

Thursday Morning: Business session; **Afternoon:** Inspection of St. Louis parks, Missouri Botanical Garden, and country estates; **Evening:** Special entertainment.

The complete program with the subjects to be brought before the convention for discussion will be published in the next issue of the CHRONICLE.

Attention is directed to the question of examinations and classification of gardeners, which was referred by the 1919 convention to this year's convention for definite action, with instructions that the secretary secure some workable plans from members favoring the subject, to submit to the convention.

The Marquette Hotel has been selected as the headquarters and meeting place of the convention. Members should communicate with George H. Pring, Missouri Botanical Garden, St. Louis, for hotel reservations at as early date as possible.

THE CLEVELAND SCHOOL GARDEN MOVEMENT.

The interest shown in school gardening by the National Association of Gardeners, following an invitation of the School Garden Department of the Board of Education of Cleveland, which was extended to the association at its convention in that city last August, to co-operate with it in the development of its school garden movement, and the practical suggestions given by the association's committee on the subject has resulted in the appointment of G. H. Pring, horticulturist of the Missouri Botanical Gardens of St. Louis, as instructor of the Cleveland summer school.

The National Association of Gardeners at its convention appointed a committee composed of Mr. Pring, Arthur Smith, of New Jersey, and M. C. Ebel, of New York, which after surveying the Cleveland school garden work made recommendations that were approved by the Science Department

of the School Board of Education. An appropriation of \$23,000 was made by the city for promoting the school garden work during 1920. Thirty school garden teachers are attending Mr. Pring's class as part of their regular program. The remainder of their time is spent in visiting children's home gardens, and supervising the youngsters' work on a dozen large tracts. There are 8,848 children under the direction of O. M. Eastman, garden supervisor.

Last year the school gardens numbered 7,840 having home plots and 415 on large tracts. Reports made at the end of the season showed that they had cultivated 175 acres and produced crops valued at \$79,835. Mr. Eastman is confident that this season will result even more successfully, one reason being the added efficiency of the workers who attend the class in horticulture. The course continues for six weeks and includes lectures on elementary gardening and practice work in the school gardens.

Up to 1918 not more than \$500 a year had been expended by the Cleveland schools for promoting school garden work.

NEW SUSTAINING MEMBERS.

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NEW MEMBERS.

The following new members have been recently added to our membership list: W. H. MacDonald, Tuxedo Park, N. Y.; Edward W. Harding, Montpelier Station, Va.; James S. Emslie, Los Angeles, Calif.; Andrew Strachan, Yonkers, N. Y.; John Tonkin, Philadelphia, Pa.; Frederick W. Chapman, Rhinebeck, N. Y.; Christopher Kiefer, Saugerties, N. Y.; Douglas Smith, Chester, N. Y.; Walter Harris, Madison, N. J.; Jacob J. Wolf, Somerville, N. J.; Josiah Brown, Roslyn, L. I.; Louis Kay, Irvington, N. Y.; Allen R. Deyo, Hyde Park, N. Y.; William Terpening, Hyde Park, N. Y.; C. G. Forsythe, Pasadena, Calif.; Albert Fattet, Riverdale, N. Y.; William Bonney, Morristown, N. J.; Fred Plumb, Roslyn, L. I.; Bernard Kappen, Garrison, N. Y.; Theodore Petersen, Bernardsville, N. J.; F. H. Godfrey, New York City.

SERVICE BUREAU PUBLICITY FUND.

The following contributions have been received towards the Service Publicity Fund up to June 30:

Previously acknowledged	\$1,524 00
Frederick W. Sparks, Lake Forest, Ill.	3 00
Frederick Lagerstam, Larchmont, N. Y.	10 00
Robert De Schryver, Prides Crossing, Mass.	10 00
John W. McCarrroll, Greenwich, Conn.	6 00
Peter Stroyan, Miliord, Pa.	5 00
Sydney Davies, Southboro, Mass.	2 00
Joseph Winsock, Locust Valley, L. I.	5 00
Owen G. Owen, Southampton, L. I.	7 00

Total.....\$1,372 00

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you give me any information respecting the principles of the Lorette system of pruning?—A. K., Ohio.

What is known as the Lorette system of pruning was discussed in an article which appeared in this journal last year, which especially advocated summer pruning of fruit trees. As some questions are being asked about it, and also as more recent readers may not have seen the article, it appears fitting to again set forth the principles of the system which, briefly, is as follows:

The points of young shoots are pinched off in July. Secondary growth results, and this in turn is pinched in August. In September the whole of the new shoot is cut back to the basal buds. These buds are to be found at the extreme base of the current season's growth, and in the ordinary way are blind or dormant. The pinching sets up in these partial development. When the entire new wood is removed in September the basal buds develop either into mature fruit buds or immature fruit buds which become fully matured next summer. These fruit buds are developed on the current season's wood, which is the special feature of the Lorette system, and distinguishes it from ordinary pruning. It will be apparent that it does away with winter pruning altogether, except where leaders want shortening. The system is especially adapted to the culture of cordon, espalier, bush, pyramid and other restricted forms of fruit trees, and there appears to be no reason why it should not be applicable to standards.—ARTHUR SMITH.

Here and There

GARDENING IN THE NINETEENTH CENTURY

HORACE WALPOLE tells us that Kent, a celebrated gardener of his day, "leaped the fence" (referring to the sunken fences then in vogue) "and saw that all Nature was a garden." Though this expression was somewhat exaggerated, it helps to convey Walpole's idea that formality in the making of gardens was no longer to be an essential characteristic. Yet champions of the old order were many. Even Sir Walter Scott urged that "wherever spectacular effect is desirable, formal beds and parterres can never be dispensed with." We have only to make a tour of the parks and public gardens to see the splendid use that is now being made of the wealth of decorative material at our disposal—plants from all parts of the world, of which no one would have ventured to dream twenty or thirty years ago.

When the bedding-out system came into vogue, it appealed to the popular taste; it was orderly; it had color. Herbaceous plants had to give way to the regularly formed beds of Geraniums, Verbenas, Calceolarias and other flowers whose colors are gorgeous in Summer, but, having bloomed, are no longer required. Two features are absent in



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"bedded-out" plants—there is a lack of individuality, and the flowers are mostly of the same color and height. One other drawback may be noted—scent is often wanting, so highly appreciated by our grandfathers. How they loved the "pot Lavender," Marigold, the "crown imperial of the Lily"! The professional gardener, however, had his way, and "bedding out" developed in a manner which was considered a remarkable exhibition of taste thirty years ago or more. As shrubs had been lopped and trained to imitate various forms of animal life, so flower-beds were made to imitate the patterns on carpets.

Speaking generally, it may be said there has been a readjustment of all these ideas, and, in adapting them to modern life, garden-makers have aimed to plan with due regard for precision of line and balance of masses. While introducing the quiet dignity of former periods, gardens have become less formal. "Uniformity and conformity had had their day." For a time, indeed, there was a violent reaction—only for a time, however—for methods more or less appropriate. Gradually we may say we have drifted towards the common-sense view that Nature must be left to herself as much as possible, but

may be assisted to give us of her best. Hence the landscape gardener studies the site of his garden—its aspect, the character of its soil, its contour. A plot of land has been compared to a human face, and "that man is unwise who, to suit preferences, for any given style of garden, or with a view of copying a design from another place, will ignore the characteristics of the site at his disposal." In a word, a garden should be in conformity with its surroundings, and the individual touch should ever distinguish it.

By the application of heat and by retardation gardeners are now able to achieve marvellous results, and experiments that a century ago would have been considered outside the range of practicability are now carried out with success.—*The Garden* (English).

SOME HINTS ON WATERING.

The operation of watering presents many problems to gardeners, so perhaps a little advice based on practical knowledge will be useful to readers. Watering is really divided into several headings, such as watering at the roots, and "damping over" to freshen or clean the foliage only.

There is a certain important preparation for watering which should always be made, if possible, and this is the hoeing and stirring of the surface soil. If this is not done, the soil is apt to cake, and in that case most of the water runs off (especially if applied with a coarse-rosed can). It may be urged that it is not possible to do this on borders filled with bedding plants or in which annuals have been planted out. And there is something in this also. But the difficulty is got over by pricking up the ground with a small fork (this can always be done unless the bedding plants and annuals are set too thickly).

The best of all watering is, of course, watering at the roots. Many times I have denounced surface waterings, sprinklings and "dampings over" to be no good at all except for giving an external appearance of freshness to the foliage. Damping over is done by "waving a can of water with a fine rose lightly about over the foliage of the plants in the borders!" It is useful at its proper times, i. e., when the roots are sufficiently wet from recent rains and only the foliage wants freshening up, but it is practically no good as Summer watering. As said previously, root watering is the essential, but this is, of course, modified as necessity arises by spraying the foliage of the plants as well.

Several problems arise on this watering. The question of the quantity to give and the question of when to apply all claim our attention and study. "At what time of the day it is most suitable to give water?" This question is still capable of being strongly debated.

Readers will, of course, well know that though the sun rises very early in the Summer months, it does not get very much power (except in the very sunny South) before eight o'clock, or sometimes nine o'clock, in the morning. That suggests to us the probable advantage of watering in the very early morning, and my experiments have shown me that the advantage arising out of early morning watering is very great indeed. However, it is not always easy or even advisable. After a roasting hot day one's annuals, especially in

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the early stage, most certainly require water, and in this case it is certainly better to give a thorough soaking at night.

In really dry weather, big clumps of perennials, Lupines, Delphiniums and many more must be watered. I find in a thickly planted border it is much better to carefully pour the water straight into the clumps with care in such cases.

And now we come to the quantity of water to give, purposely left to the last of these questions on watering, as it is vitally important. The advice may be summed up in two words: "Water thoroughly." The intentions of many readers who wield the water-can and the hose are good, but they do not all know what thoroughness means. In watering, however, do not remain spraying a single plant for several minutes, or a pool will result. Spray each plant for a short time, and then go on to the other parts of the border, returning after a time to the plants watered earlier and water again, for the first lot of water will have soaked in. In really dry times it may be necessary to return two or three times to ensure the water reaching the roots. A mere surface watering is no good in dry weather. Water thoroughly if at all.—*The Garden.*

WE HAVE STILL THE TREES

The meadow-farmers have dealt mercifully with the hedges. . . . The hedges—yes, the hedges, the very synonym of Merry England—are yet there, and long may they remain. Without hedges England would not be England. Hedges, thick and high, and full of flowers, birds, and living creatures, of shade and flecks of sunshine dancing up and down the bark of the trees—I love their very thorns. You do not know how much there is in the hedges.

We have still the woods, with here and there a forest, the beauty of the hills, and the charm of winding brooks. I never see roads, or horses, men, or anything when I get beside a brook. There is the grass, and the wheat, the clouds, the delicious sky, and the wind, and the sunlight which falls on the heart like a song. It is the same, the very same, only I think it is brighter and more lovely now than it was twenty years ago.

Along the footpath we travel slowly; you cannot walk fast very long in a footpath; no matter how rapidly at first you soon lessen your pace, and so country people always walk slowly. The stiles—how stupidly they are put together. For years and years every one who has passed them, as long as man can remember, has grumbled at them; yet there they are still, with the elms reaching high above, and cows gazing over—cows that look so powerful, but so peacefully yield the way.

Hard as the farmer may work, and plow and sow with engine and drill, the surface of the land does not much vary; but the farmer himself and the farmer's man are quite another race to what they were. Perhaps it was from this fact that the impression grew up that modern agriculture has polished away all the distinctive characteristics of the country. But it has not done so any more than it has removed the hills. The truth is, as I have endeavored to explain, innovations so soon become old in the fields. The ancient earth covers them with her own hoar antiquity, and their newness disappears. They have already become so much a part of the life of the country that it seems as if they had always been there, so easily do they fit in, so easily does the eye accept them.

Intrinsically there is nothing used in modern agriculture less symmetrical than what was previously employed. The flails

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always seen with the same accompaniment—the interior of a barn. The threshing machine is certainly not less interesting; it works in the open air, often with fine scenic surroundings, and the number of people with it impart vivacity. In reaping with the reaping-hook there were more men in the wheat, but the reaping machine is not without color. Scythes are not at all pleasant things; the mowing machine is at least no worse. As for the steam plow, it is very interesting to watch. All these fit in with trees and hedges, fields and woods, as well, as in some cases in a more striking manner than the old instruments. The surface of the ground presents more varied colors even than before, and the sunlight produces rich effects. Nor have all the ancient aspects disappeared as supposed—quite the reverse. . . . That there are many, very many things concerning agriculture and country life whose disappearance is to be regretted I have often pointed out, and having done so, I feel that I can with the more strength affirm that in its natural beauty the country is as lovely now as ever.—*The Life of the Fields.*

CULTIVATION BRINGS RESULTS

Upon the cultivation of the soil will de-

pend the successful growth of your garden crops. If you do not cultivate, do not blame any other factor if your crops fail.

Briefly, cultivation conserves the moisture in the soil, as it reduces evaporation to a minimum. By reducing evaporation it makes the soil warmer. All surfaces from which moisture evaporates rapidly, quickly cool. From an uncultivated soil moisture evaporates very freely, consequently the temperature is lowered correspondingly, and in some instances the difference in temperature between cultivated and uncultivated plots side by side has been found as much as eleven degrees, at a depth of eighteen inches; this of course is an extreme. What does this mean to the grower? Simply that if he cultivates properly the crops will mature much earlier than on a soil not properly cultivated, due to the increased warmth of the soil, and the yield will be larger, due to the moisture which was conserved.

Cultivation favors the access of oxygen to the soil, and by so doing aids materially in releasing or in rendering available the plant foods which are usually present for use by the crop. The chief of these, the nitrates, cannot readily be formed in a soil which is not cultivated or improperly so. —*Canadian Horticulturist.*

HEAT AND FRUITING

It is a matter of common knowledge that plants must have light to make plant food, but according to two scientists of the Bureau of Plant Industry, U. S. Department of Agriculture, the fruiting of many, perhaps, all plants may be controlled by regulating the period of light to which they are exposed. It is reported that either too long or too short a period of daylight in comparison with the darkness may prevent plants from flowering or fruiting. In case the period of light is unfavorable, the plants may make a luxuriant growth, but fail to fruit. A length of day that is favorable to both vegetation and fruiting is assumed to produce the "everbearing" varieties. It has been known for a long time that plants have three cardinal temperature points or zeros — an upper and lower zero beyond which growth ceases and a middle or optimum zero at which they thrive best. Frequently these zeros are different for the growing and flowering processes. Undoubtedly the upper and lower zeros are associated with temperature, but it may well be that the optimum point is determined more by light. In view of the experiments, one understands how apple trees may fail to fruit when taken to a warmer region, not because of the heat, but because the period of daylight is not favorable. A curious result of this rule is found in the case of the ragweed, which is reported to require for flowering a stimulus that is afforded by the shortening of the days and lengthening of the nights. It does not come into flower until the period of daylight falls below 15 hours. In the latitude of Washington, that comes about July 1. But if ragweed seed should be taken to northern Maine and planted, the plants would not experience a length of day below 15 hours until about August 1. Therefore, they could not come into flower until after August 1 and, though the vegetative growth might be very rank, they could not mature seed before killing frosts intervened. The long days, therefore, make it impossible for ragweed to perpetuate itself in that latitude. On the other hand, plants that get their flowering stimulus from a long day could not perpetuate themselves through seed formation at the equator, where the day never exceeds 12 hours. This principle affords the clue to the fact that many plants grow most luxuriantly near the northern limit of their range. The long northern day allows them to attain their maximum growth before the shorter day intervenes to check vegetative growth and start the productive process. The migration of birds is also said to be explained by this theory. —*American Botanist.*

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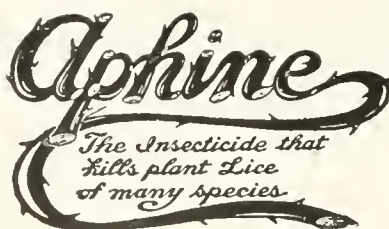
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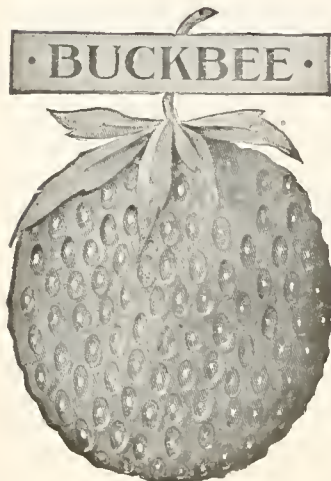
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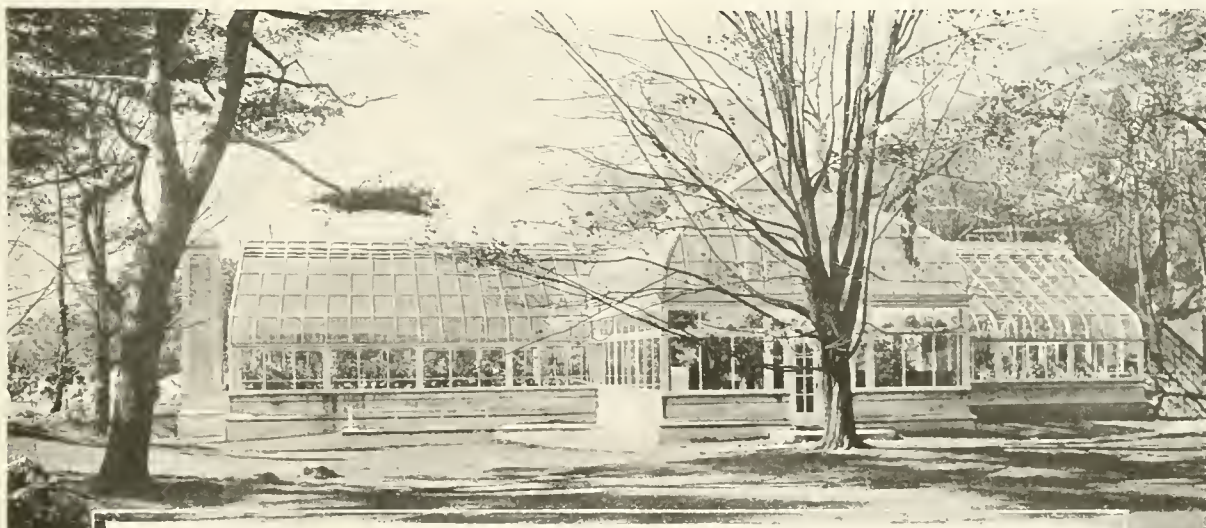
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

AUGUST, 1920

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No 8.

Things and Thoughts of the Garden

MONTAGUE FREE

AT the time of writing (July) one wonders if the weather is going to be the reverse of that of the season of 1919. Last year we experienced fairly dry weather until well into July which kept us busy with the hose and sprinklers. The latter half of the year, as will be well remembered by those who were so unfortunate as to take their vacation then, was wet—decidedly so. Up to the present this year, there have been abundant rains, ideally distributed in point of time, and the question is are we to have a late Summer and Fall as dry as last year was wet? The rains so far as can be learned have, in general, been of decided benefit. Never have I seen vegetation present a more thrifty appearance. The lawns are as green and the trees as fresh as though it were May instead of July. Rhododendrons, and evergreens generally, with the exception of those that were badly injured by the Winter, are in the best of condition as a result of the wetness. Of course there have been a few drawbacks—weeds have thriven amazingly, peas have been a poor crop in some gardens, and geraniums have been inclined to make leaf growth instead of blooming as they should, but, so far as can be ascertained there has been no disastrous fungous outbreak as a concomitant of the wet weather.

* * * *

Many gardeners on Long Island and in New Jersey that I have spoken with have declared that the Winter of 1919-20 was the worst in twenty years in respect of injury to vegetation. How much of this was due to the Winter and how much due to the fact that the growing season was extended to December by abundant moisture and comparatively high temperature? It is surely not wholly a question of low temperature as the mercury descended considerably lower two years ago with less disastrous results. It is well known that soft, sappy growth is less adapted to withstand low temperatures than that which is well ripened, and there was undoubtedly much of the former, owing to the abnormal weather conditions. Another factor that may have a bearing on the situation, is that many plants had their vitality lowered by the severe Winter of 1916-17 and were unable to stand another onslaught coming so soon after their previous ordeal.

We still have much to learn with regard to the effect of Winter on plants—whether the injury is dependent on the conditions of the preceding season, fluctuations of temperature, continuous low temperature, drying winds, the amount of moisture present in the soil, character of the soil, snow covering, city conditions, vitality of the plants, sun shining on leaves when ground is frozen, etc.,

or combinations of these factors. It is probably true that different plants react in different ways to these conditions; what we need is to know more definitely just what we may expect to happen to certain groups of plants under certain conditions so that, where possible, suitable measures may be taken.

* * * *

The Autumn blooming Crocuses are not planted nearly so much as they might be. They are delicate in coloring and dainty in appearance and are specially suitable for planting in the rock garden as they brighten it up at a time when there is little else in bloom. They are not fastidious as to soil, requiring only a well drained spot exposed to the sun. The present is a good time to plant them if corms can be obtained. A point in their favor is their cheapness, and they are not prohibited by Quarantine 37. There is not the range of color that one obtains in the Spring blooming kinds, most of them being of some shades of lilac, or white. *C. sativus*, lilac or white is a good variety, sometimes liable to become a weed due to its free seeding habits. This species has bright red style branches which provide the saffron of commerce. Other good kinds are *C. hadriaticus*, white; *C. zonatus*, pale lilac; *C. speciosus*, lilac-blue; and several varieties of the latter which are well worth growing.

* * * *

Items of interest to horticulturists sometimes crop up in unexpected places, as witness the following, culled from an advertisement by a restaurant firm that is internationally famous:—"Aristoxenus grew lettuce as the pride of his garden, and, in order to increase their flavor he irrigated them with his choicest wine." This sounds extravagant in these days of the 18th Amendment, but quite apart from this, consider the futility of watering a plant with wine in order to increase its flavor. If the flavor of plants could be influenced materially by the flavor of applications to the roots we would have to be rather more careful of the type of fertilizers used, and many that are at present highly esteemed would have to be eliminated!

During the "war gardens" craze one of the large metropolitan dailies had a cartoonist who gave facetious advice on garden matters. If this practice of Aristoxenus had come to his attention one can imagine his reply to a mythical anxious reader asking for information on how to make lettuce "head."

Aristoxenus was a Greek philosopher who flourished in the 4th century B. C. He was an extensive writer on music, philosophy, and ethics. Whatever his attain-

ments along these lines may have been, we must say, assuming his horticultural activities have been correctly reported, we don't think he displayed much acumen as a gardener.

* * * *

Although the "Bladder Senna" (*Colutea arborescens*) is not a showy plant, in the sense that some of our shrubs are, it possesses individuality, beauty, and charm that make it invaluable in the garden. The fact that its flowers are freely produced over an extended period in Summer when there are but few shrubs in bloom is an additional recommendation. Interest is maintained too, by the large, bladder-like pods which persist until well into the Fall. The flowers are yellow and the pods when mature are of a silvery appearance. A closely allied species is *C. media*, which by many is considered to be a hybrid of *C. arborescens* and *C. orientalis*. The color of the flowers of this is difficult to describe, perhaps yellowish red-brown comes nearest to it. The young pods are tinged with red on a very pale yellow-green ground color, and, as pods and flowers are to be seen in abundance at the same time, they present a striking appearance combined with the gray green foliage. The Bladder Senna is a native of the Mediterranean region and like so many plants from that part of the world succeeds best when planted in well drained soil and exposed to abundant sunshine.

The name "senna" revives distressful memories of the time when we were forced to imbibe "senna tea" as a remedy for infantile disorders. The senna leaves of the drug stores, however, are obtained from species of *Cassia*. The leaves of *Colutea arborescens* are said to contain a purgative principle and possibly it too is used in medicine. Another use for the Bladder Senna that will occur to many gardeners is that of providing young seedlings as stocks on which to graft *Clianthus Dampieri*, the "Glory Pea," a purpose for which they are well adapted.

* * * *

The announcement given out sometime ago, that the committee in charge of arrangements for the 1921 International Flower Show has "decided it would be necessary to make radical changes in the general arrangement of the show. . .", will have been welcomed by those who think that the great event was becoming somewhat stereotyped. Without doubt, with the strong committee that has charge of this matter, we can look forward to vast improvements next year. In many respects, however, it will be difficult to make this show what some of us would like it to be. Quarantine 37 will prevent it from ever being really "International" in character and until we get into our stride as producers and propagators we cannot look for very much that is startling and new in the way of plant material.

One thing that would serve to make the show more interesting would be a greater number of exhibitors with a corresponding increase of competition in the various classes. One had an uneasy feeling last Spring that if three or four of the principal exhibitors had refrained from exhibiting there would have been very little show. Of course we must remember the exceptional difficulties in the way of transportation and shortage of labor which no doubt prevent many prospective exhibitors from coming forward.

Many visitors would be interested in a scientific section. If the various scientific institutions that are experimenting along horticultural lines could be induced to exhibit what they are doing in the way of plant breeding, soil investigation, the control of fungous and insect pests, and so on it would inform the public of their activi-

ties, of which the man in the street is profoundly ignorant, and serve to show that there is something more in gardening than merely sitting around and watching plants grow.

* * * *

The Vipers' Bugloss, *Echium vulgare* is an introduced "weed" that is not such an undesirable immigrant as some that might be mentioned. It is a native of Europe and has become naturalized over a large part of the country in meadows and waste places. Wherever it occurs it is usually in abundance forming large patches of violet blue. Doubtless farmers object to it when it gains an entrance to their pasture lands, but its æsthetic value is not to be disputed when growing in large masses. The flowers are pink in the bud stage, and like so many of the plants belonging to the same family (*Boraginaceæ*) open out a bright blue or violet purple. Although its beauty may not appeal to the farmer occupied in winning a hard livelihood from poor and stony land (where it seems to thrive best), it should be easy to exterminate as it is a biennial, and the judicious use of a scythe at the time its flowers begin to show will prevent it from seeding. It is too coarse a plant to be admitted to the more intimate parts of the garden (where in all probability it would not succeed as it does not seem to care for too rich a diet) but it might be used to advantage in the wild garden on poor gravelly ground.

CULTURE OF SCHIZANTHUS

Schizanthus, commonly called "Poor man's Orchid" or Butterfly Flower, is one of the most beautiful Spring flowering plants. Its orchid-like flowers and variety of color, as well as its pyramidal habit, give it a high standing among flowering plants. In fact it supersedes many of the orchids in some respects, and its abundance of flowers and rich green foliage make it an ideal plant for decorative purposes. It only requires about six or seven months from the time the seed is planted until the plant is in full bloom. The essential requirements to grow *Schizanthus* to perfection are: good drainage, light soil not packed too firmly, careful watering, plenty of light, room to develop, and a cool humid atmosphere.

When grown under glass seed should be sown about the first week in September, followed by a second sowing in October. Cover the seeds with sifted soil, and, after giving a good watering, place in a cool house. Immediately the young seedlings develop their first two leaves, transfer them into 2½-inch pots and place in the coolest part of the house. The temperature recommended for cinerarias is ideal for *Schizanthus*. If a shelf is available place the plants there, water freely and use the syringe on bright days. Directly the pots are filled with roots transfer them into four-inch pots. At this time a small wire stake will be required to keep the plant in an upright position. It is very essential that this type of plant be given plenty of breathing space to prevent the plants from growing spindly. About the first week in January the first batch should be ready for their final pots, the six-inch size being large enough to carry them through their flowering season. It is very important that the soil be not pressed too firmly, for, unlike most other plants, *Schizanthi* delight in a loose fibrous soil. Special attention should be given to drainage so that the surplus water can pass through freely; otherwise the pot will become water-logged, and the latter condition is detrimental to all classes of plants.

A good fibrous loam mixed with one part of leaf-mold and a little sand is the soil medium that suits these plants to perfection.

Red spider is the worst enemy of the *Schizanthus*. These minute insects can be checked by using the syringe frequently. Green fly is also troublesome. The latter can be kept under control by spraying with a soapy substance or a nicotine solution.—*Canadian Florist*.

Deutzias

AMATOR ARBORUM

CARL PETER THUNBERG, the Swedish botanist, who seemed to take pleasure in naming newly discovered plants after his friends, gave to a then recently found shrub of the *Saxifragaceae* family the name, *Deutzia*, in honor of his friend and patron, Johann Van der Deutz.

Deutzias are deciduous shrubs and produce white or sometimes purplish, or rose tinted, bell shaped flowers, usually single, but double in some varieties. They are natives of Eastern Asia, particularly of Japan and China. There are about fifteen species but the number of varieties is large, and constantly increasing through hybridization. These shrubs from their first introduction have been received with great favor in Europe and this country, and are much used in ornamental planting both on private grounds, and in public parks. Their flowers, the single ones resembling quite closely those of the lily of the valley, are very pretty, and more suitable for table decoration than those of almost any other shrub. Nearly all species of Deutzias are hardy as far north as New York, especially *parviflora*, *Lemoinei*, *scabra*, *Sieboldiana* and *gracilis*.

The species.—*Deutzia scabra*, with its several varieties, is one of the most valuable of all the species, and is hardy north though it benefits by a sheltered position. It grows to a height of about six feet. The single white, or bluish white flowers have erect petals and a calyx, whose lobes fall away as the flowers expand and give a full view to the outside color of the bloom. These flowers are arranged on the branches in two to four flowered clusters and appear in June and July. This species came to us from Japan and China, very many of whose ornamental shrubs are hardy in this country. There are several interesting varieties of *scabra* well worthy of culture, *angustifolia* with reddish-brown branches, *marmorata*, whose leaves are spotted with yellowish white, *cenata*, with brown branches, *Fortunei*, whose flowers are larger than those of the species itself, and *plena* which bears double flowers. *Plena* is a very valuable variety, and of it there are several remarkably beautiful forms distinguished from each other chiefly by the tint of their double flowers. These forms of *plena*, which should be freely used in planting, are *candidissima*, whose double flowers are of purest white, and are borne in such abundance that the shrub appears a mass of small rosettes; *Pride of Rochester*, a profuse bloomer of vigorous habit, which carries long clusters of large, double white flowers, whose petals are delicately tinted outside with rose or scarlet, one of the very handsomest, and most desirable of the tall Deutzias; *purpurea plena*, which produces double white flowers, purplish on the outside; and *Watereri*, whose double flowers of largest size are a pinkish-white color, and of a flat form, resembling miniature roses.

Deutzia gracilis has slender and somewhat arching branches, and grows about three feet high. Its pure white flowers having erect, or slightly spreading petals appear in abundant clusters in May and June. This is native of Japan, and, though, perfectly hardy, is much seen in greenhouses, where it is forced into flower before its normal blooming season. Of the two varieties of *gracilis*, *aurca* has yellow leaves, and *albo-marmorata* green leaves sprinkled with white.

Deutzia Sieboldiana is of even lower growth than *gracilis* reaching a height of only two feet. The rather small

white flowers of this species, with their spreading petals appear in loose clusters in June. This native of Japan is a graceful shrub, but not as showy as many of the Deutzias.

Deutzia parviflora, a native of Northern China and Mongolia, was first brought from the Amoor Valley to the Royal Botanic Garden at St. Petersburg and thence distributed through Europe and America. The branches of this species, which grows about six feet high, have an erect habit. In June this produces lilac shaped, abundant clusters of creamy white flowers with roundish spreading petals. In many respects this is a very distinct species, its numerous erect shoots giving it a clump-like form.

Deutzia Schneideriana, among the more recent introductions, is a native of Central China growing to a height of about six feet and blooming in June. The flowers of this are nearly one-half inch long and are arranged in broadly pyramidal clusters. There is a variety of this named *laxiflora* from Western China which produces looser clusters of flowers fully as long as those of the species.

Deutzia Setchuenensis, another of the more recent introductions, of about the same height as *Schneideriana* bears flowers about one-half inch across. This is a good shrub, but not as desirable as its much handsomer variety, *corymbiflora*, from central China, whose comparatively small flowers, with spreading petals, appear in great abundance in June and July. Unfortunately this variety is rather tender in the north.

Deutzia longifolia introduced not many years ago from Western China, has an upright growth, and attains a height of about six feet. In June its very large showy flowers, fully three-fourths of an inch across, with spreading petals, are produced in large clusters. Its variety, *Veitchii*, whose flowers are even larger than those of the species, and arranged in denser clusters, is a very handsome shrub, but is not entirely hardy in the north and needs some Winter protection.

Deutzia Vilmorinæ, from Central China, grows to a height of about five feet and is one of the most graceful of all Deutzias. Its flowers which appear in May and June are fully an half inch across, and are arranged in loose clusters.

Another species coming to us within recent years from Central China is *Deutzia Wilsonii* blooming in the same month as *Vilmorinæ*. This attains a height of six feet. The blooms, fully three-fourths of an inch across, are borne in many flowered clusters in a loose arrangement.

The earliest flowering of all Deutzias is *grandiflora*, whose blooms about three-fourths of an inch long, with slightly spreading petals appear at the same time with its foliage in April and May. This species which grows about six feet high comes to us from Northern China, and has proved entirely hardy in the Arnold Arboretum at Boston, Mass. This very early variety enables us to plant the several species of Deutzias, so as to have a succession of blooms from April to July inclusive, which is hardly possible in the case of any other shrub.

Deutzia discolor is one of the tallest growing of all Deutzias, reaching a height of seven feet. This produces in June pretty white flowers with spreading petals in rather loose clusters of ten to twenty blossoms each; *major*, a larger flowered variety of *discolor*, bears blooms an inch in diameter.

Deutzia purpurescens from Southwestern China, is a very handsome shrub, but rather tender in the north, producing in May and June large white flowers with a purple tint on their outside. It is a low shrub, reaching a height of only three feet, and has slender, gracefully arching branches.

Deutzia staminea, so called from its long stamens, is a native of the Himalayas growing about three feet high. It is a very distinct variety, because the white blooms of its many flowered clusters are fragrant.

The Hybrids.—We now come to the beautiful, and highly esteemed hybrid *Deutzias*, the children, so to speak, resulting from the mating of the species. Among the finest of these is *Deutzia Lemoinei*. Its branches are more erect and stronger than those of *gracilis*, and more abundant and shorter than those of *parviflora*. It grows to the height of about three feet in a somewhat spreading form, and bears large, pure white blossoms in many flowered loose, terminal clusters, a very desirable variety both for outdoor culture, and forcing into early bloom under glass. *Deutzia rosea* produces pretty blush white, campanulate flowers. There are several varieties of *rosea*, namely, *campanulata*, *venusta* and *multiflora*, all producing large, pure white, campanulate flowers, *floribunda*, with white flowers tinted pink outside, *grandiflora* with larger flowers of the same color, *carminca* with very pretty light pink flowers tinted carmine outside, and *eximica*, whose clusters of white flowers tinted pink without are carried in upright clusters. *Deutzia magnifica* is one of the double flowered hybrids producing its handsome white flowers in June in erect clusters. There are many varieties of *magnifica*, of which *formosa*, like *magnifica* itself, bears double white flowers in large clusters, *latiflora* very large single flowers, *superba* single flowers campanulate in form, *eburnea* single flowers in very loose clusters and *erecta* similar flowers in a very dense arrangement.

Deutzia kalmiaeflora is one of the handsomest of all the hybrids. Its rather small flower clusters are made up of large cup shaped flowers, carmine on the outside and pinkish white in the center; a very distinct and desirable variety.

Uses of Deutzias.—The following grouping of the taller and the lower growing species will be helpful in indicating their proper use in ornamental planting: species growing about six feet high are *Vilmorina*, *scabra* and its varieties; *parviflora*; *Schneideriana*, and its variety; *Setchuensis*, and its variety; *longiflora*, and its variety; *Wilsonii*; *grandiflora*; and *discolor* and its variety. Species growing about three feet high are *gracilis* and its varieties, *Sieboldiana*, *purpurescens* and *Lemoinei*. All of the species in the lower growing section are well adapted for use in groups and beds on lawns, and in borders either planted continuously or at intervals with herbaceous perennial plants between. They are also very suitable for planting as single specimens on lawns of quite restricted area. *Gracilis* makes a pretty, low-growing hedge. The species of the taller section may be planted in large groups on spacious estates, or in the foreground of larger shrubs, or trees, or in corner groups, or at intervals in borders under north or west walls with herbaceous perennials between. A large group embracing both the taller and lower species may be planted away from any background by setting the several taller species in the centre and the lower as a border around these, or by setting the taller species against a background of trees or wall and the lower species in the foreground of these. As single specimens on lawns only those of the taller species having the more slender and arching branches should be planted. The erect growers, especially those having a

clump-like form, show too much the main stems and lack the graceful habit of growth suited to such a position. To lovers of flowering shrubs a collection of *Deutzias*, embracing many or all of the species, and varieties, including the beautiful hybrids, will bring great satisfaction, well repaying the moderate, necessary expenditure.

Soil, pruning, propagation.—*Deutzias* are of easy culture, and will thrive in any well drained soil in the open sunlight, or in such partial shade as they might receive in the foreground of larger shrubbery or trees. The dead and very old wood should be cut out, and such pruning of the newer growth given after the flowering season is over, as will conduce to symmetry.

Deutzias are propagated either by seeds sown in the Spring in boxes, or seed pans of light soil under glass, or by greenwood cuttings in Summer in the sand of the propagating bench under glass, or from hardwood cuttings taken when the shrub is dormant in late Autumn, and wintered in an upright position in boxes of sand deep enough to almost cover the top of the cuttings, in a cool cellar, and set out in the open garden in early Spring.

PLANT MORE WOODLANDS!

TO possess a piece of woodland as part of a country property is indeed a valuable feature thereof and something which time alone can produce. Even when resorting to the planting of large trees for immediate effect there is still the absence of that "woody" aroma, the deep leaf mold and trees of lofty height which come only with age. Despite the pleasure which a piece of woodland, with its winding shady trails, wild flowers, fern studded nooks and, perchance, an area for picnics, give to the country dwellers, the planting of a grove of trees does not receive the attention it should in planning the landscape of an estate. Many owners may balk on the selfish standpoint that they will not live to see the maturity of the woodland plans, but the great majority are not averse to planting for posterity and will be quick to accept the suggestion of such a planting when made by the landscape gardeners, nurserymen or florist, and for any of whom it means a good sized order of trees and shrubs.

In the composition of a woodland one associates Oaks of various species, Tulip tree, Birch, Beech, Ash, Sugar Maple, Gums, Hickories, Walnut and (if not in the blight infested region) Chestnut. If of evergreens, we think of Pines, Hemlock, Fir or Spruce. Or, if the area is large enough, a combination of evergreens and deciduous trees.

There is another class of plants which, although most essential to the successful growth of woodland trees, are frequently overlooked, namely, the smaller trees and certain shade loving shrubs which should be planted to form the ground work cover or forest floor. This protective covering serves to keep the ground moist and porous, retaining the fallen leaves and twigs which go to make up the humus which in turn absorbs the rainfall, prevents washing of soil and furnishes ideal condition for the tree roots. Trampling of the ground so that air is excluded is also discouraged by this under planting even though it be nothing more pretentious than the Cat-briar (*Smilax*).

Nut trees should not be overlooked, if squirrels are to be encouraged, while for the birds such berry bearing trees and shrubs as Mulberry, Cherry, *Cornus*, Juneberry (*Amelanchier*), *Photinia*, White Fringe, Spicebush, Viburnums and many other plants should be considered. If the ground is low and swampy the Spicebush (*Lin-*

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Goldenrod Honey

H. W. SANDERS

IT has been sometimes proposed to make the goldenrod the "National Flower" of the United States, as it is so widely distributed, some variety or other being found in nearly every section of the country from the Atlantic to the Pacific, and from the tropics to the severe climate of the Canadian border. The family of goldenrods (*Solidago*) comprises a very large number of varieties, so many in fact that there are some that have never been described or named. There are about eighty named kinds, ranging from dwarf and insignificant forms to the tallest kinds that form some of the most conspicuous and handsome of the wild flowers.

The value of goldenrod for honey depends largely upon the locality, in some parts there being very little if any honey gathered, and in others there being a plentiful surplus of very nice honey. In the New England States, one of the best authorities on beekeeping states that the goldenrod would be his choice if he had to stake the existence of beekeeping on any single flower, and from those regions clear across the northern States it is a honey plant of great importance. The honey is thick and rich, of a beautiful golden yellow, and so thick that sometimes there is difficulty in extracting it. It granulates readily and sells well, for once people get the taste for it they have a way of demanding it in preference to all other honey. Some beekeepers have solved the "container" problem by allowing their honey to granulate and then cutting it into blocks like butter and selling it in neat cartons. So long as one can be certain it is not exposed to temperatures sufficient to melt the honey, this is the very best method of selling it.

Goldenrod begins to flower at the end of July and continues through August and well into September. Sometimes the bees can work on the plants for six weeks, and coming as it does late in the season, the colonies are likely to be at their strongest. One can always tell when goldenrod is coming in, for the hives are busy from morning till night and a peculiar smell, rather sour, can be detected, often at a distance of several rods from the hives. Just what causes this is not known, but it is very characteristic and has even been mistaken before now for the strong and disagreeable

smell of foulbrood—the worst disease that affects our bees.

During the time when goldenrod is in bloom there are several duties that can be performed with profit. The hives should be gone over every week and carefully inspected to see that all is in the best of condition for Winter. Leaving this until late in Fall makes it impossible to give the bees proper attention for when all the honey-flowers have perished the bees try to rob one another to such an extent that opening of the hives should be done only when absolutely necessary and then as quickly as possible. So that we always aim to do this work while there is enough honey coming in to keep the bees busily occupied and the job can therefore be accomplished in comfort.

Some of the things we aim to attend to in preparation for Winter are to see that there are good combs in the part of the hive that will be the bees' Winter home. The combs they go into Winter quarters upon are the ones that will be used for next Spring's breeding operations, and an excess of drone comb will mean that we shall have altogether too many of these unprofitable consumers in 1921. So we aim to see that combs are all worker-comb, and straight and clean. Then there is the food supply. We aim to see that the storage combs for Winter are filled with the best of the season's honey, for poor honey is liable to granulate in the combs and starve the bees to death in the midst of plenty, as they cannot eat granulated honey in Winter.

Finally, and most important, the condition of the queen calls for the most careful attention. If she is getting old, and the brood is scattering, or contains too large a percentage of drones, then she should be replaced by a young queen, either purchased from a dealer or raised at home. A vigorous young queen is a good investment in the late Summer for the honey stored the next year will be gathered by her bees and if she is a better one than the superseded queen, there will be many more bees.

Hives should be watched to see that they are tight and well made and old rickety ones patched up or discarded. Bees will suffer in the chilly days of Fall and Spring if their houses are not warm.

PLANT MORE WOODLANDS!

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dera Benzoin), Button Bush (*Cephalanthus*) and Alders will be at home as cover plants. Then we have the native *Rhododendron* and Azaleas, Holly, Dogwood, Snowberry, Hazels, several *Viburnums*, Chokeberry and Huckleberry (*Vaccinium*).

Frequently a grove of trees is planted to screen some objectionable outlook; one of the commonest faults in the selection of plants for this purpose is to omit the dense low growing sorts which serve not only as good "cover" subjects, beneficial to the growth of trees, but retain their low branches and thereby form an effective base screen after the tall trees have grown up and lost their lower branches. Such trees as the Hornbeam (*Carpinus*), especially the European species (*C. betulus*), which holds the dead foliage throughout much of the Winter; Ironwood (*Ostrya virginica*), *Cornus florida*; Beech, when on the border, and many shrubs should, therefore, be included with the tall fast growing trees if the lower part of the screen is to be perpetual. In selecting the species of trees to be planted it is well to avoid too large an assortment. Limiting it to a few kinds is more pleasing and

natural. In fact, a pure stand of one species is very effective, though it has the disadvantage that if a blight—Chestnut, for instance—or epidemic of an insect pest comes along, it may destroy the entire plantation, whereas, in a mixed planting, there are likely to be immune species.

A woodland is also not without its commercial value and if one will "plant thick and thin quick" a more rapid up-right growth is induced by the close planting and the trees removed in thinning may be used for poles, posts, rails and various purposes for which small timber is utilized.

The value and enjoyment of a woodland to a country place should, therefore, not be underestimated, and nurserymen in recommending the establishment of such a planting will find a sale for much stock as well as making it the means of bringing pleasure and satisfaction to tree-loving clients.—S. M. BAXTER, *Florists' Exchange*.

[In closing Mr. Baxter's valuable paper we must add from our own observation that even on a one acre proposition a small woodland planting to occupy one-sixth to one-eighth of that area, can be urged on your customers as one of the permanent and most agreeable parts of the property.—Ed.]

Polyantha Pompon Roses

THE Polyantha Pompons may be said to be the children of the Rose garden, for their chief charms are their freshness, gaiety and liveliness of effect. Their dwarf growth and compact, brightly-colored little blossoms seem to suggest youth and make for cheerfulness. They are specially useful in small gardens, where the Ramblers, many of which have similar flowers, but a very different habit, might take up too much space; and they do not require so much skill in cultivation as do the Teas and Hybrid Teas.

Like all Roses, the Polyantha Pompons need good soil to start with; good turfy loam for a depth of 2 feet at least, preferably 3 feet, should be given them, and a certain amount of well-decayed manure may be added to the lower stratum of soil. They should be planted in October or November and firmly trodden in. They can then look after themselves till the following March or April, when they should be pruned hard back. In after years they can be merely thinned and allowed to grow into good-sized bushes some 4 feet or 5 feet high, when they can again be cut close to the ground. Treated in the latter way these little Roses look very charming in small beds on the lawn—such beds as are often filled with Begonias or Zonal Geraniums. The Roses are infinitely less trouble than these tender plants, which have to be dug up in October and wintered in a frame or greenhouse; and often they will go on flowering till Christmas. They are seldom much troubled with mildew or black spot in the way so many of the Hybrid Teas are apt to be. They may require a little syringing to get rid of green fly during May and early June, and after that we can just enjoy their beauty and marvel at their profusion of bloom. Some of the best for beds are:

Mrs. Cutbush.—Pink; a very charming variety.

Orleans Rose.—Bright rose, produced in large panicles.

Ellen Poulsen.—Deep rose; fragrant.

Maman Turbat.—Pale pink; light green foliage.

Katharine Zeimet.—White; good early and late; honey scented.

Jessie.—Bright cherry red; best in Autumn, generally flowering well right on to Christmas.

These are all old and tried favorites which we have grown for many years. Some newer ones also worth growing are:

Coronet.—Very dwarf and distinct; flowers pink and pale yellow.

Perle Orleanaise.—Pale salmon pink; neat-shaped flowers.

Triomphe d'Orleanaise.—Crimson with a shade of magenta. The flowers are larger than those of *Jessie*, and in the early Summer it is the more showy variety of the two; but *Jessie* comes into her own in the Autumn, and if only one of these crimsons is grown, I shall certainly prefer *Jessie* on account of its brighter coloring.

Little Meg.—A recent introduction.—The flowers are larger than most of the Pompons and are a delicate milk-white, showing up well against the glistening green *Wichuraiana*-like foliage. In shape and size they resemble the China Roses, and are, to my mind, more graceful for cutting purposes than the characteristic rosette-like blooms of many of this family. The buds have almost the beauty of form of a miniature Tea Rose. *Little Meg* is certainly a good autumnal, for our bed of this variety was full of bud and blossom last Autumn right into November. They have a slight Briar-like

scent which is very pleasant. The *Wichuraiana* Shower of Gold is one of *Little Meg*'s parents; this accounts for the beauty of foliage, and this variety might almost be called a dwarf *Wichuraiana*. In many ways it is like the dwarf *Wichuraianas* which were brought out some years ago, of which *Seashell* and *Iceberg* were two of the prettiest; but *Little Meg* has larger flowers and is altogether more vigorous and more showy than these older kinds.

The Polyantha Pompons when grown in beds look very well if they are given an edging of some compact-growing *Viola*, especially if the reds and pinks are surrounded with white *Violas*, such as *White Swan*, and the whites with pale mauve *Violas*, than which none is better for the purpose than *Kitty Bell*. All who visited the Chelsea Show in 1919 must recall with pleasure the delightful effect produced by the clever grouping of these Polyantha Pompons with *Violas*; some of the Roses were budded on dwarf standards; some were what we call dwarf plants. They were arranged in a very effective manner and carpeted with mauve *Violas*; both Roses and *Violas* were charmingly fresh and attractive in coloring, and the exhibit was a proof of what a delightful little Rose garden could be made with the Polyantha Pompons alone.

Again at the Royal Horticultural Society's Show at Chelsea on June 1 of this year was demonstrated the exceedingly pretty effect which may be obtained by a free use of the Polyantha Pompons. The plants were all in pots and were grouped on the ground; at the corners were well-grown specimens of the rambling *Polyanthas*. Some of the Pompons were in standard form, and these varying heights gave a gracefully undulating contour to this delightful exhibit.

Three new varieties attracted my attention at this show. The first was *Edith Cavell*, a bright cherry-crimson color with a white eye, but without the white streak which detracts from *Jessie*'s charms. The individual blossoms are also a little larger than those of *Jessie*, and the trusses are larger and on longer stems, more in the way of the *Orleans Rose*.

Verdun has an exceedingly neat and compact little flower of rounded form and of a uniform tint of bright cherry scarlet. The flowers grew closely together in the clusters, which were erect and very freely produced.

Eblaiissant looked almost more like China than a Polyantha Pompon. The deep crimson flowers were more loosely put together and had larger and more pointed petals than is usual among the Pompons, and reminded me of the old favorite *Cramoisie Supérieure*, and perhaps even more of the less well known *Princesse de Sagan*. Though perhaps not so brilliant in effect as either *Edith Cavell* or *Verdun*, the rich coloring and artistically shaped flowers of this variety were to me very pleasing.

All the Polyantha Pompons last well as cut flowers, but their lack of fragrance detracts to my mind very considerably from their value for this purpose. The deep rose-colored *Edith Poulsen* is the only dwarf Polyantha which has anything approaching a real Rose scent; and raisers of new varieties should not rest content till they have produced varieties in this group which possess in a marked degree the most endearing of all the Rose's attributes, namely, fragrance.—*The Garden*.

Pruning Ornamental Shrubs

HENRY J. MOORE

THOUGH much has been written on the subject of pruning ornamental shrubs, it would still appear that the practice is not generally understood, for we find that in few places the work is properly done. One of the chief reasons that many plantations of shrubs quickly become dilapidated is that a wrong idea of the manner and time of pruning exists, and so the practice has a harmful effect upon their growing and flowering qualities.

In all pruning operations we must recognize two distinct types of shrubs—(a) those which flower upon the current year's wood and (b) those upon the old or previous season's growth. Usually failure to discriminate between these leads to trouble. The operator may unknowingly cut away the flowering growth annually, and so prevent the beauty of the plantation from developing.

It is not difficult to distinguish the types. The Hydrangeas and the Roses are examples of the first mentioned, and the Lilacs, shrubby Honeysuckles, Weigelas, Viburnums (Snowballs), Deutzias and Forsythias of the latter. Generally those which flower upon the current year's wood should be pruned in Spring, and those on the old wood as soon as flowering is past. There is an exception to this rule of which notice must be taken. Shrubs which bear so-called berries (fruits), even though they belong to the class which flower upon the old wood, should not be pruned after flowering, as this will eliminate their Winter's beauty. In this category are examples, as the white and red fruited Snowberries (*Symphoricarpos racemosus* and *vulgaris*), *Berberis* and deciduous species of *Euonymus*. Shrubs which bear these ornamental fruits may be pruned at any favorable time during Winter before the new Spring growth begins to appear. In this case the pruning may be termed "thinning," as only when the subjects are overgrown is a cutting back necessary. To severely prune would remove the desirable fruit bearing growth.

Pruning shrubs which flower upon the current year's growth.—In mild climates it is a good plan to prune shrubs at once after flowering, but where severe Winters like our own pertain those which flower on growth produced during Spring should not be pruned until danger of heavy frosts is past, otherwise the remaining buds may be injured, which is often the case when bright sunlight succeeds excessive frost. When this occurs growth may be seriously impaired and the flowers of course be correspondingly injured. Usually the lower buds will produce strong flower bearing growth, therefore it is good practice to prune severely in the case of Hydrangeas and many kinds of Roses, unless for some reason large bushes are desired. The way to obtain good blooms of *Hydrangea paniculata* is to remove the weakest growths entirely, leaving only four or five of the strongest and to cut these back so that only two strong buds are left at the base of each. When these develop the weakest should be rubbed off. The remaining buds will make strong growth and produce large flowers.

Pruning shrubs which flower upon the previous season's growth.—Shrubs of this nature which are dependent upon the formation of new growth for the following season's flowers should be pruned as soon as the flowers fade. The removal of old flowering wood or branches will favor the development of new growth, and the subsequent ripening of flowering buds before Winter arrives.

This a careful removal of the old flowering wood should be undertaken during Summer. In the case of the Lilacs, it is important that this be done before the seeds are formed.

When pruning shrubs the following simple directions, if followed, may be helpful: Do not leave stubs when removing branches, each undesirable portion should be removed with a slanting cut at its junction with another stem, or just above a bud or joint. If it is necessary to shorten or "head back" the longest stems, do not cut them at the same height. Encourage growth close to the ground rather than at the apex of the shrub. To induce this gradually remove the longest branches. The reason for encouraging young growth is as follows: The strongest stems grow very quickly to the light, thus the small lateral ones become badly shaded. This may result in partial or full defoliation, and sometimes death, it simply being a case of survival of the fittest. You may have noticed the bare and unsightly stems near the ground while the apex is crowned with leaves. When, however, the stronger stems which are growing out of bounds are removed and the lower lateral ones are encouraged, this unsightliness is rarely apparent. Unless we carefully prune our shrubs dilapidation will quickly ensue, but where the practice pertains renovation will constantly take place, much to the enhanced appearance of our plantations.

Briefly, the objects of pruning may be summarized as follows: To encourage the development of vigorous growth and the subsequent production of flowers; to eliminate worthless branches and superfluous growth and thus favor the equal distribution of light, air and moisture to all parts of the shrub; to remove defective parts, to promote growth to replace these and thus assist nature to restore symmetry.

When we realize that the Summer pruning of many of the shrubs with which we grace and beautify our parks and home surroundings is of the greatest importance, our plantations will assume a different appearance, for we will practice this vital thing. We must, however, be sure that we know the nature of our subjects and not prune the shrubs which like the Hydrangea and the Rose flower upon the current year's wood and should not be pruned until Spring. Now is the time to start renovating the millions of shrubs all over this fair land. Unless Summer pruned, they will never blossom in their fullness.

Primarily, the whole trouble with the United States is the lack of deep, whole-souled religion,—a religion that makes every man realize his responsibility to other men and to the world and to Almighty God; a religion that makes every man realize that until he has, in his own thought, put himself in the other man's place, and then treated the other man as he would, under like circumstances, wish to be treated, he has failed to follow divine leadership. Until all people accept the religion of Christ in this spirit, no universal panacea can be found for present conditions. There must come a widespread and almost universal revival of religion, pure, and undefiled, or we cannot hope for the settlement of all the problems which now confront our country.—*Manufacturers' Record*.

SEASONS FOR PLANTING PLANTS AND LAWNS

PLANTING seasons for herbaceous perennials are divided into Spring and Autumn in the North. One of the first factors when planting older plants is the blooming period of the species under consideration. As the blooming period is one of great activity above the ground, those plants which bloom late in the season, like *Anemone Japonica* and Chrysanthemums, should be moved in the Spring when they can make root growth more quickly and thus recover from the shock. On the other hand, those plants which bloom and mature early are practically dormant in late Summer and early Autumn. Thus, *Iris* and Peonies can be moved safely about September 1, and will recover quickly and make new roots before cold weather sets in, whereas they are very active in Spring and often do not recover from the shock of being moved at that time unless the work is done very early. These are probably the first sorts fit to move in the Autumn season, and other sorts follow along as they mature. The planting season for perennials would open earlier in the Spring on a light soil than on a heavy one, both for a mechanical reason and because a heavy soil warms up more slowly. The texture of the soil is a factor affecting the planting season of perennials more than it does other larger rooted plants, and it is better to delay Spring planting until the soil is in good condition to handle and is warm. Thus the Spring perennial season is likely to start later and last longer than that for woody deciduous plants, and also start earlier and stop earlier in the Autumn. Pot-grown plants and seedlings can be transplanted at odd seasons whenever the weather is right, but is generally best to wait till Spring for all young herbaceous plants, thus giving them the whole growing season in which to get established. Care should be taken not to bring tender plants out too early, before they have been hardened off, or too late, when the torrid Summer days will wilt them down before they take root.

The Spring seeding season for lawn grass starts in the Lower Austral Zone in February, about the middle of the month, and continues to May 1, but may be shut off by the advent of hot weather as early as March 1. As one goes farther north, the season does not lengthen very much, but merely opens later, extending from about April 15 to June 1. Thus this seeding season, to a great extent, overlaps the planting season and cannot be protracted past the closing date for planting without great risk of the bad effect of hot weather on the young grass. The Autumn season starts in the North as early as August 1, and closes not later than October 1, but generally by the 15th or 20th of September, thus not overlapping the Autumn planting season to any extent. As one goes southward, the season again merely shifts along, so that, in the Upper Austral Zone, it opens about September 15 and closes about November 1, while in the Lower Austral it is pushed along to October 15. Here the common practice of seeding stops, except for the use of English Rye as a green Winter carpet, and is superseded by the practice of "sprigging" or planting pieces of Bermuda and St. Augustine Grass. This grass planting is commonly done in southern Florida in June, while farther north, and especially in Alabama, it is done through the Winter months so as to take advantage of the then abundant rains.

Grass seed sown too early in the Autumn and not artificially watered will generally lie dormant until the Fall rains start germination, and likewise seed sown too late in the Autumn or too early in the Spring will lie dormant until the ground warms up sufficiently to start sprouting. The grass seeding season is from the time the ground

gets warm enough in the Spring until it gets too cold in the Autumn to start the germination process, but this season is as a matter of practice divided into two parts by the period in the Summer when the ground is too dry to start germination and the weather is so hot as to require constant artificial watering, both to start germination of the seed and keep the young plants alive. It is also generally considered wiser not to seed so late in the Autumn, in the North, that the young grass plants will not be well established before freezing weather.—*Albert D. Taylor in Landscape Architecture.*

WATERING, CULTIVATING AND MULCHING

HAPPY are they who know just when to discontinue the practice of watering, or to withhold water, when to apply it would be to the disadvantage of the crops. Water should never be applied to the extent that the soil becomes sodden. This prevents proper soil aeration, and is detrimental to the formation of plant foods. It favors acidity of the soil, a very harmful condition. Water should not be applied to the extent that it hinders timely cultivation, nor in such quantities that it runs away as drainage. When this occurs it always removes large or small quantities of valuable plant food in solution. Thus when the soil is saturated to about eighteen inches or two feet deep, and this can be determined, water should be withheld until after proper cultivation, the plants require a fresh supply. Continual heavy waterings deplete the soil of available plant food more completely than does the crop to which the water is applied.

The general discontinuance of watering garden crops should take place at the first sign of maturity. At this time the crops do not draw so heavily upon the moisture in the soil. Water in large quantities is thus unnecessary, and if applied may be harmful. As growth declines a natural but gradual drying off process takes place, and as the roots lose their function they will rot in a wet soil. Just an instance of this—onions which have been overwatered during the ripening process, or if the season is wet, often rot in the soil. Sometimes through these causes they do not ripen properly and will not keep for any length of time when stored away for the Winter.

Overwatering the crops may be equally as harmful as insufficient applications. Experience is the great teacher. In the hands of an inexperienced person the hose or the watering can may do more harm than good. Not so when experience has taught the way. For when properly used to supplement cultivation they are of the greatest value during a dry season.

As crops approach maturity, and their spreading foliage prevents cultivation, it may if dry weather prevails be excellent practice to afford a mulch of some kind to hold the moisture. If a mulch of stable litter—straw shaken out of the manure pile by means of a fork—is spread along or between the rows, the soil moisture will not readily escape. It is not good practice to mulch too early in the Summer, as the mulching material must be removed every time cultivation is undertaken. This on a large plot means labor. The greatest disadvantage, however, accrues from the fact that if the soil is not cultivated every few days roots are encouraged to the surface, and when cultivation is performed and the soil thoroughly stirred, the roots are broken and a severe check to growth may be administered. Thus in the case of maturing crops, or those which have spread so as to prevent proper cultivation, a mulch is proper and may be of the greatest value.—*Canadian Horticulturist.*

The Month's Work in Garden and Greenhouse

HENRY GIBSON

WHILE the garden has been feeding us bountifully during the past weeks it has come to the season of the year when we should begin to think of feeding it if we would have it feed us well another season. It is only a square deal and a common sense proposition to thus assist Nature in establishing a new supply of plant food to replace that which the crops have used up. Of course it is claimed by some authorities that this is not Nature's feeding time. A liberal application of plant food, plowed under in Spring, is supposed to keep things going, supplemented with an occasional dose or two of concentrated fertilizer through the growing season. But the home gardener who must practice intensive culture on account of the restricted area he has to cultivate, and reap several crops in quick succession from the same ground must necessarily hand Nature a more liberal diet. A generous supply of plant food with each crop and plenty of smaller applications of fertilizer as supplements is needed to secure best results.

Plant food whether artificial or natural is scarcer than ever before, with but little brighter prospect for the future. How to keep up the fertility of the soil for next year's crops is a mighty serious problem for everyone to consider.

We can save and make plant food in compost heaps; we can also begin and make Nature produce part of her own food in the form of cover crops. In doing these things one needn't expect to see one cent's worth of immediate benefit. Why plan to feed the crops nine months later? Why worry about next year's crops? Well, if you feel that way, your enthusiasm is on the wane.

It is well, however, to know that there are limits to the value of green manuring as applied to the home garden. The green manures do a lot, but they will not do everything. Some gardens are better off without them altogether. There are three reasons for growing cover crops in the garden, of which the first is indicated in the name—a covering of the ground so that the soil will not be washed away and its plant food constituents leached out by rains. Obviously, this applies chiefly to slopes subject to erosion and to sandy soils subject to leaching, but not to fairly level ground of medium texture. The second reason is to supply humus, or decaying vegetable matter to a soil deficient in this respect, whether sandy or clayey.

If one has an unlimited supply of farmyard manure available it is not necessary to supply humus otherwise. The third reason for a cover crop is to add to the soil actual enrichment in the form of nitrogen.

Any kind of plant that grows thick and fast enough will serve to protect the ground from erosion and leaching. Likewise several kinds of plants are suitable to supply humus. But there is only one group of plants that supply nitrogen, and there is no plant that produces phosphoric acid, or potash beyond what is actually present in the soil. In actual plant food contributed by cover crops to the soil without charge we have only nitrogen. No other essential fertilizing element is added. The other elements are merely taken up from the soil by the cover crops and returned to the soil sometimes improved, and the humus combination. Nitrogen is a costly element and well worth getting for nothing. If your crops have been pale and yellowish in color and lacking in size it shows

a need of nitrogen. On the other hand, too luxuriant growth, with a scantiness of fruit, shows an oversupply of nitrogen and a lack of fertilizing elements.

It is the legume family that adds nitrogen to the soil. The bacteria that live on the roots of these plants take the nitrogen from the air. The legumes include peas, beans, vetch, clovers and alfalfa. To give the ground the maximum benefit such plants should be plowed or spaded under in a state of semi-maturity, but your garden is enriched to a certain extent when one merely grows such crops, harvesting seeds or tops, leaving roots and stalks to decay.

Plants that add no plant food to the soil but serve as a protection against erosion, supply humus and incidentally hold down weeds, include rye, oats, barley, buckwheat and rape. A mixture of these with legumes has the advantage of killing two birds with one stone, supplying a liberal amount of nitrogen, as well as a supply of humus, or organic matter. Moreover, a combination of plants often succeed better than a single sort. Of course, sections of the country will differ in the adaptability of both the combined and separate crops and if one would be sure of success one would do well to get in touch with the nearest experiment station.

Of the various cover crops some die on the approach of cold weather and others endure the Winter. In the former class, which may well be called the Summer planted crops are cow-peas, buckwheat, soy beans and field peas. In the latter class are rye, crimson clover, hairy vetch and cowhorn turnips. Rye is the most generally useful cover crop we have. Planted in late Summer or early Fall, it will make a fairly good growth, even on poor soils in every section of the country. It is one of the best crops with which to begin the work of soil improvement. If one or two rye crops have been turned under it is a much easier matter to get a good stand of clover or vetch.

Most home gardeners will make no mistake in planting rye this Fall after harvesting the crops. If the rye is mixed with hairy vetch seeds, so much the better. A bushel of rye and 20 pounds of hairy vetch seeds is about right for an acre. A peck of rye and five pounds of vetch will be enough for a garden 100 x 100 feet.

Usually it does not pay to unduly modify one's cropping program for the sake of green manuring. Put in the cover crop as early as possible, and turn it under as soon as you are ready to use the ground. In the case of the legumes most of the nitrogen is gathered in the early stages of growth, hence it is not necessary to wait for mature growth before turning under. In fact there are disadvantages, especially among the cereal plants used as cover crops in letting them make too heavy growth. The stalks and fibres become tough and take longer to decay than do the succulent young plants; and in a dry season the undecayed mass of turned under vegetation forms an impervious layer which is not at all congenial to the roots of the regular crops that may be planted. For the time at least the soil is more harmed than benefited. Imperfect turning under of a heavy crop also does more harm than good. A chain attached to the plow when turning under will do much to eliminate this trouble.

(Continued on page 281)

The History of Our Common Vegetables

(The following notes on the history of our more common vegetables are compiled from the interesting catalog of the Stokes Seed Farms Co. and published with permission of that company.—EDITOR.)

ASPARAGUS (*Asparagus officinalis*).—A native of Europe, having grown in its wild state in Great Britain, Russia and Poland. The Britons, Gauls and Germans used it merely as a medicine. Gerard states that it takes its name after the Latin, in that it signifies the first spring or sprout. The Romans introduced it as an edible food. Cato the Elder, 200 B. C., treated the subject with great care. Pliny distinguished a fine difference in the character of Asparagus grown near Ravenna and certain other outlying points from Rome. Its cultivation and use as a vegetable was made known to the people of the North by the invading Roman armies. It is spoken of as a cultivated English vegetable in the early sixteenth century; and in 1683, we have record of it in the London markets.

LIMA BEANS (*Phaseolus lunatus*).—Apparently the pole lima bean was known in America long before the discovery. It is a native of Tropical America, probably Peru or Brazil. Although quite different in general form and appearance from the ordinary string bean, *Phaseolus vulgaris*, it is, nevertheless, closely related. The lima bean was met with by the Spaniards on their first contact with the Indians of Florida, Mexico and Peru. Wild forms of the lima bean are known in the Upper Amazon River Valley and its seeds together with certain other vegetable seeds have been found in ancient Peruvian tombs at Ancon. The Indians of both North and South America were well acquainted with the species. The traditions of the cliff dwellers in our southwestern desert country have it that they were first gathered from the nearby cañons, thousands of years previous.

BEANS, GREEN-PODDED (*Phaseolus vulgaris*).—This genus which includes such species as the Kidney Beans is undoubtedly of South American origin, inasmuch as until the discovery of America none of the beans of this family were cultivated in Europe. M. de Candolle, author of the "Nativity of the Bean" and considered an authority on the subject, produced strong data to prove that Tropical America was its original habitat. Among other points mentioned, is the fact that several kinds of this species have been found in Peruvian tombs at Ancon. Furthermore, shortly after 1500, the Kidney Bean began to be grown extensively in Europe where it has entirely supplanted the common beans for garden purposes. The name "Kidney Bean" was given it because of its shape. The Indians were growing certain types at the time of the discovery of America, but they were not grown commercially here until a comparatively recent time.

BEET.—A native of Europe, North Africa and Western Asia. It is named *Beta* because its seed pod resembles the shape of the Greek letter of that name. It has also been suggested that it came from the Celtic word *Beta*, meaning red. *Beta vulgaris*, the parent of our garden varieties, is a native of Egypt, thus identifying two or three so-called Egyptian beets handled by present day seedsmen. The native parent grew wild along the southern shores of the Mediterranean, and was found as far east as the Caspian Sea and Persia. "Everything," according to de Candolle, "shows that its cultivation does not date from more than two or three centuries before the Christian Era." It is not known exactly when the beet root was first introduced into cultivation. The ancients were well acquainted with the plant, but we have no account from which we can have certain knowledge that they cultivated it.

CABBAGE (*Brassica oleracea*, Var. *capitata*).—Undoubtedly the entire *Brassica* group can be traced to the wild Cabbage, *Brassica oleracea*, which grows wild on the sea cliffs of the English Channel and the Western European Coast. The Roman name *Brassica* is supposed to have come from the word *Prasceco* because it was cut off from the stalk, the word Cabbage referring to the firm head or ball which is formed by the leaves. The Cabbage is one of the vegetables which has been cultivated from the earliest times. To quote Vilmorin, "The ancients were well acquainted with it and certainly possessed several varieties of the head-forming kind. The great antiquity of its culture may be inferred from the immense number of varieties which are now in existence." A more wonderful example of a genus producing so many distinct forms of vegetation for the use of man is scarcely to be met with throughout the range of the vegetable kingdom. The leaves of this plant were probably eaten by the

barbarous or half civilized tribes of Europe, and when history begins the plant had been transferred to cultivated grounds and produced heads. It appears to have been in general use before the Aryan Migration, 1700 B. C., and in the time of Cato and Pliny many distinct varieties were known in Rome.

CAULIFLOWER (*Brassica oleracea*.—L. Var. *Botrytis*, D. C.).—A native of Europe and West Asia, having been under cultivation some time before the Christian Era. It apparently was well known to the Greeks and Romans, at least in its cruder form. It is not until more recent times that the vegetable has been refined to its present condition. Pickering states that cauliflower was first mentioned in 540 B. C. Hehn, a German writer, states that true cauliflower is of Eastern origin and came to Europe via Venice and Antwerp. The Moors of Spain are said to have written about it in the twelfth century, having received it about that time from Syria.

CELERY (*Apium graveolens*).—Of European origin. Ancient writers give no definite information of this vegetable, and it seems doubtful whether celery was cultivated until some time after the Middle Ages. Until long after the fall of Rome it was not freely distinguished from parsley. Homer mentions *Selinon* in the Odyssey, but this is thought to refer to a wild form of celery. In 1629 A. D. Parkinson states that "sellery is a rarity in England," and apparently celery as we know it was not a common vegetable in Europe until after 1800.

CORN (*Zea Mays*, Var. *saccharata*).—Probably a native of Peru, Darwin having found heads of Maize embedded in the Peruvian Coast 85 feet above the present sea level. Botanists universally concede that corn originated in America and as its close relation, *teosinte* is indigenous to Mexico, some have placed it there rather than farther south. In 1914 Dr. F. H. Knowlton came on a fossilized ear of corn in Kuzco, Peru, thus giving us tangible evidence of the geologic existence of the species. It is one of the first evidences of vegetables being transferred from prehistoric to geological time, possibly taking it back a hundred thousand years. The type of the fossil ear has many of the characteristics essential to the domestic varieties still being grown in Peru and Bolivia. The name corn was given it by the North American Indians. The reference to corn amongst the Egyptians of Biblical times was not corn as we know it, but some other grain, possibly wheat. Indian corn, however, was found under a comparatively high state of cultivation on the discovery of the New World. The first variety of sweet corn, under cultivation, was reported in the region of Plymouth, Mass., where it had come from the Susquehanna Indians in 1779.

CUCUMBER (*Cucumis sativus*).—A native of the East. Vilmorin crediting the East Indies, while de Candolle places Northern India as point of probable origin. Vilmorin, being a close student of the subject, we are inclined to give preference to his deductions. Cucumber is one of the oldest cultivated vegetables, being under cultivation long before the Greek and Egyptian civilization, although it was well known to both. Pliny writes at length on the subject, and makes special reference to the cucumbers as supplied to the Emperor Tiberius, who wanted them available every day in the year. The cucumbers of the Scriptures were probably a wild form of melon (no doubt of Persian origin), which was common in Egypt at that time.

ENDIVE (*Cichorium ediva*).—Probably a native of the East Indies, placed by some, however, as indigenous to Egypt. In the latter place they are called the wild *endive cichorium*, hence the confusion between this and the chicory, or French endive. The vegetable is mentioned by Ovid, Columella, Horace and Pliny. The latter states the plant was eaten both as a pot herb and a salad by the Romans. It was supposed to have had strong medicinal qualities, and was used with telling effect by the ancient magicians. Endive was introduced into England apparently in 1548, during the reign of Edward the Sixth. Gerard speaks of it and tells how it was preserved for Winter use in the time of Queen Elizabeth.

LETTUCE (*Lactuca sativa*).—A native of Asia. The exact country of origin is not certain, neither the date when it was introduced into Europe, but scientists agree that it has no doubt been under cultivation from very remote times. The name lettuce is no doubt a corruption of a Latin word *Lactuca*, on account of the milky juice known to the vegetable. Herodotus tells us that lettuce was served in its natural state at the royal tables of the Persian King over five hundred years before the Christian Era. According to Pliny, the Romans were not acquainted with

much of a variety of this vegetable; however, it was known to have marvelous cooling qualities and was often used to reduce fever. There was no attempt to cultivate lettuce in England until the fourth year of Queen Elizabeth's reign (1562).

MUSKMELON (*Cucumis melo*).—A native of Southern Asia, cultivated from a very remote period of antiquity, perhaps having come from the oblong fruit of the Persian melon, the date of its first culture being unknown. It is considered to be as old as any of the alimentary vegetables. That the Egyptians knew and grew melons seems to be well established by certain well-known verses in the eleventh chapter of the Book of Numbers of the Bible. The Romans and Greeks were familiar with it in its cultured form, as it appears to have been brought from Persia at least before the first century. Pliny speaks of it at length, describing the difficulties of obtaining melons for the Emperor Tiberius all months of the year. There are many and various classes of melons, one of the oldest and best being the cantaloupi, which, according to M. Jacquin, derives its name from Cantaloupe, a seat belonging to the Pope near Rome, where this sort, brought from Armenia by the missionaries, was first cultivated.

ONION (*Allium cepa*).—A native of Western Asia, having been cultivated from the most remote period, from the references to it in Sanskrit and Hebrew. It is also represented on Egyptian monuments. Numerous references to it in Biblical history speak of the remarkable sweetness of the onions from Egypt. The name onion is no doubt derived from the Latin word *unio*, meaning a single root. The Greeks and Romans, according to Pliny, name the different sorts after the countries or cities from which they came, such as Scallian which, no doubt, is responsible for our common word scallion. We are told that the Cypress Onion "drew the most tears." Although ancient scientists were never able to locate the onion in its wild form, Vilmorin states that a Frenchman, M. Regale, discovered a plant in Turkistan which has the appearance of being a wild form. A similar discovery has also been made in recent years in the Himalayas. Unquestionably, the onion is one of the oldest vegetables known to man.

POTATO (*Solanum tuberosum*).—Native of the high valleys of the Andes; Chile, Peru and Mexico. The name has evidently been given it from the word *batata*, the Indian name for sweet potato. It was also called *papas*. Apparently the first specimens to be brought from the New World came from Quito, and from Spain they were gradually disseminated through Europe, first to Italy, thence to Mons, Belgium. The governor of Mons, recognizing the great possibilities of the new genera, sent specimens to the celebrated botanist Clusius in Vienna in 1598. During this time, however, the English had also discovered the great value of potatoes as a vegetable. Sir Walter Raleigh has credit for bringing the potato to Ireland in 1586. They were planted in Sir Walter's estate in Cork and soon had a reputation throughout all of Ireland, where it was known many years in advance of England. This fact no doubt accounts for the common expression Irish potato.

PEAS (*Pisum sativum*).—Of uncertain origin, but probably a native of Central Europe or the mountains of Central Asia. They have been cultivated by man from a very remote time. They take their name from the Greek word *Pisa*, a town of Elis, where peas grew very plentifully. In 1596, they were spelled *peson* in England, thence the present spelling. Pliny, in the first century, refers to ancient writers having spoken of peas and we have numerous references to them in Biblical history, especially amongst the Hebrews. We are told that at Damascus there were many shops where people did nothing else but fry peas, as they were considered to be especially fine for travelers. Dioscorides, the physician to Anthony and Cleopatra, recommended them very highly. A. de Candolle is of the opinion that peas were known to the Aryans 2,000 years before Christ, and that they, perhaps, brought them into Greece and Italy. Peas have also been found in the Swiss Lake dwellings of the Bronze Period. Peas were further introduced in England during the reign of Henry VIII. However, they were very rare until at least the time of Gerard in Elizabeth's reign.

PEPPER (*Capsicum*).—A native of South America, the generic name of this plant being derived from the Greek word signifying to bite. This plant was first mentioned by Martyr in 1493, according to Irving's Life of Columbus. His book states that Columbus "brought back pepper more pungent than that from Caucasus," apparently having compared it with the black pepper of commerce from the oriental countries. There is evidence to show that it was cultivated by the natives in Tropical and South America, long before Columbus' discovery. According to Gerard it was brought into European gardens about 1600. First reference of pepper to be used as a condiment is apparently by Chauca, physician to the fleet of Columbus.

SPINACH (*Spinacia oleracea*).—Probably of Persian origin. The works of the early Arabian physicians speak of the medical properties only. It does not seem to have been introduced as a vegetable until about the Fifteenth Century. The fact that Spain was perhaps the first European country to introduce it as a vegetable was no doubt responsible for its being known to the older botanists as *Hispanach*. Beckmann, who wrote about 1790, says the first use of spinach as a vegetable was in 1351, at that time being eaten by the monks on fast days. Turner, an English botanist, writing in 1538, states that it was known in England at that time. By that time the name had developed into spinage and spinech, both of which terms were used.

TOMATO (*Lycopersicum esculentum*, Var. *vulgare*).—Galenus, a celebrated Greek physician, 200 A. D. gave a minute description of *Lycopersicum* coming from Egypt. South America, probably Peru, however, gave the tomato to Europe in a highly cultivated form. The name is derived from the Aztec word *Nitomate*, the vegetable having been prized and extensively cultivated by the natives long before the discovery of the country by the Europeans. According to Dr. Tracy, "there is little doubt that many of the plants as seen and described by the Europeans as wild species were largely garden varieties, originally natives of America, which are a variation or crossing of the original wild species." It was first introduced into England in 1596, but for many years was grown only as an ornamental plant, under the common name of Love Apple, the prevailing opinion being that they were poisonous to man. The tomato in Europe was first used as a vegetable in Italy in the seventeenth century, later being introduced into France and England as a table vegetable. The first mention of it in North America as a vegetable, apparently, was 1781. Seven years later a Frenchman in Philadelphia made earnest efforts to have people use the fruit as a vegetable, but with little or no success. The first record of this fruit being regularly quoted on the market was in New Orleans, 1812.

THE MONTH'S WORK IN GARDEN AND GREENHOUSE

(Continued from page 279)

If you have a vacant lot that you intend to turn into a garden another year right now is the time to get started, building it up with cover crops. In the warmer states, one of the Summer cover crops may be sown, then turn it under and plant one of the Fall crops. In the Northern and colder states one will have to be content with getting in a Fall cover crop in the late Summer. Rye is excellent, and a mixture of rye and hairy vetch is even better.

The question of cover crops on one side, the month's big jobs are harvesting, or beginning to harvest and make the most of every available vegetable in the garden.

Onions may be pulled at any time now, let the tops die down, and rake over every day until thoroughly dry. Store in open shed until in danger from freezing, remove tops, and store in cellar in open crates. Preparations should be made to prolong the supply of salad by planting lettuce seeds now to be later transplanted to cold-frames; vegetables may be planted under glass for Winter supplies, including beans, tomatoes, radishes, cucumbers and melons if wanted during the Winter.

Flowers for wintering in frames should be sown at once if not already done. Pansies, English daisies, *myosotis*, half hardy perennials and biennials. Those sown during July are now ready for transplanting outdoors in the flower gardens. Many of the perennials may be reset, after breaking up the old clumps. In the greenhouses, roses are now growing rapidly, and a top dressing of bone meal will be beneficial to them. See to it that all diseased leaves are picked off, and do not let the surface of the soil become baked and hard. Stir it up at frequent intervals, but as the roots permeate the soil more and more be careful not to stir too deep or one may damage the roots. Watch carefully for mildew, and use sulphur on its first appearance. On cold, raw nights a little fire heat will prove a valuable aid in keeping mildew in check. Red spider should also be attended with a good stream from a hose, in capable hands.

A Lesson on the Dietic, Medicinal and Economic Values of Vegetables

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE Under the Direction of ARTHUR SMITH

AS the dozen or so lessons under this heading have been in the main devoted to matters connected with the production of garden crops, it appears at this time fitting, or at least not unfitting, that we should consider some points relating to the use of garden produce.

The events of the past few years have brought into existence a large number of people who now grow more or less of the vegetable requirements of their households; people who before made practically no use of the ground surrounding their homes.

Before the war, most people, even those who always had plenty of home-grown vegetables at their command, ate vegetables simply as an adjunct to animal food and even today they still do so to a considerable extent. As much, or nearly as much, meat was, and sometimes is, eaten when vegetables formed part of the meal as when they did not. While many have realized the wastefulness of such custom; have been forced to economize in animal food by substituting for it the direct fruits of the earth, with such benefit to their physical welfare that very few would be satisfied to return to the old regime, there are still numerous families who not only do not make use of vegetables to the extent to which it is desirable, but who do not gain all the good they might from those they do consume.

We believe that to a certain degree there has been some check to the greatest possible use of vegetables by the method of measuring food-values entirely by calories.

A calorie is not a substance, but is a unit for measuring heat expressed in food values, in the same way that a yard is a unit for measuring length and a pound for measuring weight. Roughly speaking a calorie equals the amount of heat required to raise the temperature of a pound of water four degrees F.

There is also something more contained in the word calorie. What is called heat and what is called energy are really different forms of the same force. All the organs and tissues of the body are built from the nutritive ingredients of food. With every motion of the body and with the exercise of feeling and thought, material is consumed and which must be supplied and replaced by food. In a sense the body is a machine, and like all other machines, it requires material to build up its several parts, to repair them as they are worn out, and to serve as fuel.

From the time foods are taken into the body they undergo great chemical changes, very many of which liberate heat. It is through these complex chemical and other processes that the body derives energy for internal and external muscular work, and for the exercise of brain-power. Also, part of the material which serves the body as a source of energy is used for building it up and keeping it in repair.

The chief uses of food, then, are two: (1) To form the material of the body and repair its wastes, and (2) to furnish muscular and other power for the work the body has to do, and to yield heat to keep the body warm. In forming and reforming the tissues and the fluids of the body the food serves for building and repair. In giving power and heat it serves as energy.

If more food is eaten than is needed, more or less of the surplus may be, and sometimes is, stored in the body, chiefly in the form of fat, which forms a sort of reserve supply of fuel and is upon occasion utilized in the place of food. When the work is hard, or the food supply is low, the body draws upon this reserve of fat and grows lean.

In order to be sure that we are stoking our body engine rightly we must be able to say both how much energy our food yields and how much energy our bodies use. This is where the calories come in, for we can measure both food energy and body energy in calories.

Varying according to age, size, occupation and climate, an individual requires to assimilate per day food containing from two thousand to five thousand calories. These calories only refer to the three ingredients upon which food values have been based, namely, protein, which has a value of 1,820 calories to the pound; fat, 4,040 calories, and carbohydrates with a value of 1,820 calories to the pound.

But a sufficiency of all of these in properly balanced proportion can be consumed while at the same time the individual may be badly nourished, in fact it is possible for starvation to result.

There are many more ingredients besides protein, carbohy-

drate and fat required for a nutritious diet and to prevent and remove that malnutrition which is becoming more and more prevalent among all classes of people and of all ages. The average diet and its method of preparation appears to be getting farther away from Nature and we are becoming more and more a race that is sustained by artificially prepared products designed by chemists in the laboratories. Hence nervous breakdowns and rest cures multiply. It has recently been publicly stated that America is suffering from wide-spread malnutrition, not from lack of sufficient food expressed in calories—on the contrary the average number of calories consumed per head is larger today than ever—but from lack of those elements not measured by calories. What is called "lack of vitality," "run-down," "not thriving," can in almost all cases be definitely traced to an insufficient supply of certain elements.

In addition to protein, carbohydrate and fat, the animal body contains, and therefore requires in its food, more or less of chlorin, fluorin, iron, phosphorus, calcium, potassium, magnesium, manganese, sodium, sulphur, silicon and iodine. It is important to realize that the human body must be constantly supplied with all of these although the quantity of each that is necessary is very small, and it is only by the consumption of vegetables that we can be sure of obtaining them, and a superabundance of any elements can never take the place of a deficiency in others.

Unfortunately the prevailing methods of cooking and so-called refinement, remove entirely most of these vital ingredients and at the same time greatly reduce the percentage content of those which remain.

All these elements are contained in the soil in varying proportions; they are also all of them part of every plant's requirements, and as the plant has the power of obtaining them from the soil, which the animal has not, it therefore follows that the only natural way for the individual to obtain them is by consuming the plant. Of course plants vary in the proportions of these ingredients they contain, as examples, spinach contains a larger percentage of iron, while the cabbage contains more sulphur, than other vegetables.

There is considerable analogy between plant and animal life, which as regards food requirements, is almost complete. In both, all their constituents must be present in their food, and no excess of one or more will make up for deficiency in others.

Not long ago a scientist took up the work of demonstrating what an important part the mineral salts play in plant life. This investigator placed seeds of grain in a solution of water, iron oxide, calcium nitrate, magnesium sulphate, potassium nitrate, potassium chloride and phosphoric acid. In this solution the plants attained to normal, healthy growth, but in other solutions from each of which one or more of the above salts had been omitted the plant was seriously affected. When the grain was grown in a solution from which iron had been omitted the plant was lacking in the development of chlorophyll, which substance gives the plant its green color, and corresponds with the hæmoglobin, or red coloring matter of the human blood. Just as there can be no satisfactory plant life without chlorophyll, there can be no animal life without hæmoglobin. Both depend upon iron for their existence. Other experiments have indicated that magnesium, calcium, iodine, silicon and manganese exert a powerful influence in the growth and development of plants and in the same manner we know that their presence is equally necessary in human foods.

One of the mysteries of plant life is how they are able to take certain mineral elements and compounds, some of which are deadly poisons, and so change them that when absorbed into the human system their action is not only without harmful effects, but is actually beneficial, and in fact their presence is necessary for health. Iodine, for example, would not be a healthy solution to swallow, but when the thyroid gland is deprived of it the health of the whole body is sure to suffer.

The lack of understanding of the chemical practices of Nature has led us into many errors. When the chemist analyzes human blood he reports that the iron of the red corpuscles is iron oxide. However it is a fact that the iron in the blood does not exist in such form. The failure to understand that a deficiency of certain minerals in the body cannot be remedied by

going to a drug store and purchasing supplies of mineral salts to take internally has worked much harm to the human race generally and has built large fortunes for the manufacturers of patent medicines. The various minerals that are contained in the blood and organs of the human system are present in complicated forms that cannot be easily duplicated by the laboratory practices of man, but which are duplicated by, and are contained in, plants, or as we call them when upon our tables, vegetables. The sooner we realize to the fullest extent that the only satisfactory and sure way to get minerals which are needed in the human body is by eating vegetable food containing these essential elements the better it will be for us and the worse for the makers of patent medicines.

In addition to those ingredients which are measured by calories and to the others embraced under the term mineral salts, those curious chemical bodies called Vitamines cannot with impunity be absent from our diet.

Vitamines were first discovered by Funk during his investigations into the cause of Beri-beri, and they have called forth a great amount of research during the past few years.

Funk found that when fowls were fed upon polished rice they developed Beri-beri in from one to six weeks, and died in a few days after the onset of the disease. But if an extract of the rice polishings was injected into the blood the birds recovered magically in a few hours. Thus it was evident that a substance was present in the pericarp of the rice grain which when removed from the diet allowed the disease to occur, but which was also capable of curing the disease, although the latter was fully developed. He isolated this body and named it "Vitamine." The quantity in any food is extremely minute, only six grains being obtained from one hundred pounds of rice pericarps.

The part of grain called the "pericarp" is that containing the embryo of the seed and which the process of polishing rice removes.

Vitamines are found in all fresh vegetables and fruits which, while they are not destroyed by boiling, are invariably lost if the water in which the vegetables are cooked is thrown away.

It has been experimentally observed that when animals are fed on specially vitamine-containing food the gain in weight is out of all proportion to the amount of food consumed, which shows that another attribute vitamins possess is to cause an increase in the assimilation of food eaten. As most people know, it is not what we eat but what we digest and assimilate that does us good. Therefore it follows that, providing vitamins are present in the diet, a much less amount of nourishment is required to be taken, and less strain is thrown upon the organs of digestion and assimilation. To briefly summarize then:

Vitamines are substances present in many foods, especially in fresh vegetables and fruits.

As they are removed by the water in which vegetables are boiled, a liberal use of salads and fruits in our daily diet is the only way of being sure of getting a sufficient amount of them into our system.

Their control growth and nutrition to such an extent that they are indispensable.

Their presence in the diet economizes food.

Besides the essential constituents already mentioned vegetables contain a considerable proportion of indigestible matter known as fiber which is principally composed of cellulose. This is by no means useless, being in fact valuable. It forms bulk or ballast, which by its merely mechanical effect stimulates intestinal action. Therefore the usefulness of vegetables to the human system falls under three distinct headings, namely:

Food value, that is its richness in proteid, carbohydrate, fat and mineral matter.

Vitamine value.

Bulk value.

The great importance of the point must be our excuse for again alluding to the fact that the mineral, vitamine and bulk values are not included in any system of caloric measurement.

Now in the usual plan of preparing vegetables for the table—namely by boiling—there are always some of the calories left behind in the water, and in the majority of cases the mineral and vitamine contents are nearly all, and frequently quite all, lost by the solvent action of the boiling water. Consequently, it is evident that a method of cooking which dispenses with the immersion of vegetables into boiling water will not only economize the food ingredients present but add tremendously to their nourishing and hygienic values.

There is probably none of our vegetable foods which is generally treated in a more wasteful manner, both in the preparation for cooking and in the process thereof, than the potato, and what is left of it after cooking is, especially in hotels and dining rooms merely a lump of soggy matter difficult to digest.

If a transverse section of a potato is examined, three distinct layers can be made out. The central one constitutes the largest portion of the total bulk and is almost entirely composed of carbohydrate; this is enclosed by what is called the fibro-vascular

layer, somewhat darker in color, making about one-twelfth of the entire tuber. This layer is rich in proteid and contains the bulk of the mineral matter and vitamins. The outermost layer forms the skin. If the potato is peeled before cooking, a large portion, sometimes all, of the middle layer is cut away and thus the valuable contents of this layer are entirely wasted. But the waste does not end with the act of peeling, for in boiling a peeled potato a considerable proportion of the nutriment left by the knife is dissolved out in the boiling water; this, too, is generally wasted, although it could form a basis for soups. Therefore it follows that, in the case of the potato the only method of obtaining its maximum value is to cook it without removing the outer skin. It is true that many people do boil potatoes in their skins, and in this form they sometimes figure upon the hotel menu as "*Potatoes a la robe de chambre*," but we fear that peeling potatoes after they are cooked is a very exceptional practice. The highest flavor, palatableness and digestibility of the potato are only secured by baking them in their skins, but unfortunately this way, especially with those of large size, entails the drying up of the middle layer and as it is only the mealy interior which is generally eaten, the valuable constituents of that middle layer are lost. Some people, however, realizing the value of this middle layer, consume the whole of baked potatoes, provided they are sure that the skin was scrubbed clean before cooking.

Within our limits it is obviously impossible to deal specifically with the varying characteristics of each of the different vegetables, but there are one or two points connected with some which cannot be passed over.

As regards legumes, in which family are included peas and beans, the most noteworthy feature is their richness in proteid, containing as they do some twenty-five per cent of this ingredient. In these the proteid is in a form called by chemists "legumin," which closely resembles the casein of milk, and is in fact extracted from the Soja bean and a cheese made from it. This legumin combines with lime salts, if they are present in the water, to form an insoluble compound, it is therefore necessary when one is obliged to use hard water for boiling them to first precipitate the lime with bicarbonate of soda.

The onion, and its brother the leek, are the vegetables which are richest in Vitamines, and it is no doubt to this that the stimulating, germicidal and generally beneficial effect of onion gruel is due. Raw onions are equally beneficial and are known to act as a nerve tonic. There will be no great loss in boiling provided the water is made use of, although there is no doubt that some of the essential oil of the onion is driven off by the steam from the boiling water.

In connection with the onion there is a story told of a medical practitioner who went to a country district with the idea of purchasing a practice there. Upon arrival he discovered that not only did the gardens contain a good sized onion patch but that there were many fields of them as well. Thereupon he went away without considering the purchase, remarking, "These people are too healthy with all these onions to require a doctor very often."

Some people are wise enough to eat some raw onions every day and for this purpose a good way is to use them in the form of scallions which can be had in one's garden all the year round. These scallions are best produced from what are called "top-onions," that is, they form their bulbs during July on the top of a stalk. These bulbs should be planted singly, in the same way as onion sets, as soon as ripe and they can be obtained in August and later from the seed stores. They are never killed by frost, but as it is difficult to get them out of hard frozen ground a sufficiency for Midwinter use should be planted in a cold frame.

In the case of all vegetables requiring to be cooked, the only way by which we can obtain the full benefit of their natural constituents is by steaming. This method can also be made to result in considerable economy in fuel as food-steamers are on the market with shelves enabling several vegetables, and also meat, to be cooked at the same time on one gas, or other burner. This method does not transfer the flavor of one thing to another, but the flavor of each is retained to a greater extent than when immersed in boiling water, and there is, of course, absolutely no loss of any of their ingredients.

When it is possible to use them in that state, the eating of vegetables raw is the best way, and no one should allow a single day to elapse without eating some vegetable that has not been cooked. Most of us are, however, somewhat chary about ordering a salad at restaurants as we are rightly skeptical as to whether the salad has been properly washed, but there is nothing to prevent the serving of a salad composed of fresh materials from one's own garden once a day for the greater part of, and by the use of cold frames, all the year.

The early and continual use of raw vegetables as part of our

(Continued on page 287)

Departments of Foreign Exchange and Book Reviews

Horticultural Education in England for Women.—The appeal which the Horticultural College, Swanley, is issuing will, we hope, meet with a generous response on the part of all who desire to advance the cause of women's education. The college has been in existence for some thirty years, and during that time, and in spite of severe financial limitations, it has been the means of training some 1,000 women in horticulture. Of this number some have entered the ranks of professional gardeners, others have taken up positions abroad and are now doing horticultural work in different parts of the Empire—Canada, the Transvaal, Cape Colony, Natal, New Zealand and elsewhere. The remainder have, perhaps, not applied the knowledge of horticulture they gained at Swanley to professional purposes, but we may be sure, nevertheless, that they have been able as citizens to apply it to good purpose. Apprehension is sometimes entertained by professional gardeners lest the advent of women among them should affect adversely the position of men gardeners. We think this apprehension is unfounded. Capable gardeners, of which this country can claim so large a number will always be able to hold their own against no matter what class of competitor. It is to the interest of the profession of horticulture that the numbers of highly skilled gardeners should be yet further increased, and that the incompetent should be eliminated. In our opinion horticulture has far more to suffer from the pretensions of inadequately trained gardeners of either sex than from the competition of women. In any case, there can be no question but that the training in horticulture available for women should be as efficient and complete as that which is open to men. The educational facilities which are now in existence for men are gradually becoming adequate to the needs of the profession. The recent decision of the University of Cambridge to establish a School of Horticulture will, we hope, mean that promising young gardeners will be able to pursue advanced horticultural studies and qualify for the not inconsiderable number of posts which are being established in the counties. Training in horticulture is available at University College, Reading, for both men and women and other schools of horticulture also exist. It is, nevertheless, important that there should be in this country one or more schools of horticulture for women; schools in which women may develop their own methods and pursue them in all the many branches of horticultural art and science. If this is to be done endowment is essential, for no form of higher education can be self-supporting. The Ministry of Agriculture is prepared to give assistance to Swanley to the extent of £10,000 on a pound for pound basis—that is, for every pound subscribed up to this sum the Ministry will provide a like amount.—*The Gardeners' Chronicle* (English).

Education of Young Gardeners.—I was very much interested in the short article by William McCombie, Osgodby Hall Gardens, Selby, in your issue of April 24, about head gardeners giving boys in their employ encouragement by explaining the why and the wherefore of things, when they make mistakes. I remember well the good advice given me when a boy in the gardens at Meutmore, by that fine gardener and grower, Mr. William Duncan, now of Bosworth Hall, Rugby, I believe. He never tired of explaining things and giving encouragement, and although 40 years have passed, I have very grateful remembrances of the pleasure he gave me. I well remember how he used to allow me to take charge of a range of greenhouses if the regular journeyman left for a vacation of a day or a week, and I used to work early and late to gain his approval. If more foremen and head gardeners would do this we should have many more and better gardeners today. Helpful criticisms and explanations are never forgotten by a boy who is worth while and is interested in his work, as I can testify.—*Frederick C. Green, Supt. of Parks, Providence, R. I., in the Gardeners' Chronicle of London.*

"Miniature" Hyacinths.—The judges had a difficult task before them, for no fewer than 465 suggestions were sent in for a suitable alternative to the old term "miniature" as applied to Hyacinths. It took a long time to go through them all and appraise their suitability, but finally the five pounds offered by Messrs. Sutton was awarded to Miss C. Helen Rottenburgh of Holmhurst, Downhill Gardens, Glasgow, for the word *Cynthella*. I cannot do better than quote in full her interesting letter:

"Might I suggest as a name for Miniature Hyacinths the word *Cynthella*? It is made from the last syllable of Hyacinth with

a diminutive ending, and also after Cynthia, for which *cide* 'Pope' (Epistle II, 17-20):

'Come, then, the colors and the ground prepare!
Dip in the rainbow, trick her off in air,
Choose a firm cloud, before it fall, and in it
Catch, ere she change, the Cynthia of the minute.'"

—*The Garden.*

Carnations.—These were in great force at Chelsea, and never have we seen the flowers more worthily presented. Head and shoulders above all the rest, however, were those from Messrs. Allwood Brothers, Hayward's Heath, who, in conjunction with the Carnations, demonstrated the excellence of their new race of hardy Allwoodi Pinks. Novelty at this great flower festival is ever looked for, and is rarely disappointing, though it is safe to predict that not the most sanguine of the habitués of these gatherings ever expected such a wealth of it as these new Pinks revealed, such ravishing colors or engrossing fragrance. We candidly confess they were in the nature of a revelation. Not in all our experience of Temple and Chelsea flower shows—and we have seen them from the beginning—have we seen their like, though, as the result of but a decade of careful and thoughtful work, greater things than those we are now reviewing might be achieved. This new race of hardy Pinks was the most epoch-marking novelty of the show, and while worthy of the highest and best award from the spectacular standpoint, merited something more as a recognition of the marked advance in the flower horticulture of the time. In fragrance alone these Pinks were as a few thousand flowers of the old crimson Clove, their entire proximity was pervaded with rich perfume. They were associated with the Carnations the firm grows so well at the end of one of the most spacious tents, great galleries flanking the imposing vases of the last-named flowers in wondrous array, engaging the attention and admiration of thousands of spectators. Four of them—Harold (white self), Jean (white, maroon center), Robert (rose, crimson base) and Rufus (old rose)—secured Awards of Merit by unanimous votes. Hardy, fragrant, easily grown and readily increased, with great flower freedom over a prolonged season are a set of attributes rare indeed, difficult to equal, much less excel.—*Gardening Illustrated.*

Gold Flora Medal for Messrs. Allwood Bros.—We are informed that a mistake was made in the official list of Awards at the Chelsea Flower Show, and the president and council have now amended the award given to Messrs. Allwood Bros. for Carnations to the higher Gold Flora Medal, instead of the Gold Medal mentioned in the list. We believe an award of the large and handsome Gold Flora Medal is of rare occurrence.—*The Gardeners' Chronicle of London.*

Irises.—That these take front rank among hardy flowers of the best none will gainsay, nor will any take exception to the statement that none among hardy flowering subjects affords a greater wealth of blossom or is harder or more accommodating. It is for these reasons and for the large part they play in this unique flower festival that we give these "Orchids of the garden" a place apart and specially urge them upon the attention of our readers. We do this not alone because they are worth seeing or because we desire every reader of *The Garden* to make real acquaintance with them, but rather because we are not equal to describe the indescribable or to paint a word picture calculated to do justice to them. In a center group is placed the unique Dominion, a wondrously rich piece of coloring. Isoline, the inimitable, too, is great—as much in stature as in freedom and color. Prosper Laugier, Iris King, Sweet Lavender (quite a suggestive and good name), Gagus, Clematis (an Iris wonder), Mlle. Schwartz, Lady Foster, Lord of June, Morwell, the giant Alcazar, Dusky Maid, Asia and others must be sought out and inspected. It is the only way of realizing their beauty, or even the half of it.—*The Garden.*

Azaleas.—The species that have been instrumental in producing the various garden Azaleas are *A. calendulacea*, *A. nudiflora*, and *A. occidentalis* from N. America, *A. pontica* (*Rhododendron flavum*), a native of the Caucasus, Asia Minor, etc., and *A. mollis* and *A. sinensis* from China. Although mentioned here as *Azalea*, they are, of course, from a botanical point of view *Rhododendron*, the various specific names receiving the necessary revised termination. The influence of the various species can be noticed

in many of the varieties in the shape, color and size of the flowers.

A. nudiflora is a bush 7 feet to 9 feet high at its best, but often dwarfer. The flowers are usually pink, not strongly scented, the corolla-tube long and rather slender, and the petals narrow. The expanded flowers are each about 1¾ inches across, and six to nine or more are borne in each cluster. It is a native of Eastern North America. Varieties with pale or deep pink flowers often bear a distinct resemblance to this species.

A. calendulacea is also a native of Eastern North America. It is very similar in height to the last-named, and is distinguished by its bright, flame-colored flowers, which are brilliant shades of red and orange. The corolla-tube is shorter and broader than in *A. nudiflora*, whilst the petals are also broader. The flowers are not very fragrant, although many of the reds and orange-scarlets, which suggest this parentage, have fragrant blossoms, due to the influence of another species. In America it is known as the Flame Flower on account of its giving the mountain sides, at the time when it is in bloom, the effect of being a mass of flames.

A. pontica (altered by botanists to *Rhododendron florum* to distinguish it from the evergreen *R. ponticum*) is a native of Eastern Europe, Asia Minor and other places. It forms a large bush up to 10 feet high and bears rather large and very fragrant, bright yellow flowers. It is from this species that many of the garden forms inherit their delightful perfume. Its influence may also be seen in many of the varieties with fragrant orange or yellow flowers.

A. occidentalis.—This is a Western North American bush 6 feet to 9 feet high, with fragrant white, yellow-blotched flowers produced during June or early July. Crossed with various garden varieties, a number of very beautiful forms, usually with white or pink, yellow-blotched flowers, has appeared. These are later than other garden Azaleas and usually begin to flower as the others fade.

A. mollis.—This is a Japanese species with larger and more formal-shaped flowers than those previously described. It forms a spreading bush 4 feet to 8 feet high, bearing flowers with great freedom. The blossoms vary a good deal in color, and may be red, rose, salmon, yellow of various shades, or almost white. It is closely related to *A. sinensis*, which differs in its shorter and more rounded petals, and the hairiness of the leaves. It is more distinctly a native of China than *A. mollis*, which is a doubtful Chinese shrub. The two species have been intercrossed and have resulted in many free-flowering hybrids, which are characterized by their peculiarly pleasing colors and large, shapely flowers. The flowers have, however, little or no scent. The *mollis* group flowers earlier than the kinds derived from the American and Eastern European species, and is less suitable for cold districts. They are, however, invaluable for forcing, while they give excellent results in many gardens.

Other species that have received less attention from the hybridist are:

A. vaseyi, a shrub up to 12 feet high, native of the mountains of Carolina, bearing pale pink or almost white flowers freely during late April and early May.

A. arborescens, a shrub attaining a height of 20 feet in Eastern North America. Its white or pinkish flowers are fragrant and borne during late June or early July. It is of erect habit, with shining, dark green leaves.

A. viscosa, the Swamp Honeysuckle, is a rather dense bush 6 feet to 8 feet high, which produces white or pink flowers freely in July. The flowers are deliciously fragrant, but are rather disagreeable to handle, as they are covered with viscid hairs.

In addition to these there are several species from China which bear reddish-purple flowers, such as *rhombica* and *dilatata* (*R. rhombicum* and *R. dilatatum*), which bloom in April and are suitable for gardens where Spring frosts are not experienced. There is also the *A. indica* group, of which many very attractive hardy forms have recently been introduced from Japan, and we have also the beautiful free-flowering *A. Kämpferi* and *A. amana*. Of *A. Kämpferi* there are forms with salmon, brick-red, and reddish-purple flowers. In addition to being such beautiful flowering shrubs, the Azaleas have a further period of beauty, for the leaves turn to brilliant shades of red, orange and bronze in Autumn, a condition retained over a period of three or four weeks.

When purchasing plants for beds or informal masses it is not necessary to obtain named kinds, for quite as brilliant effects can be secured by planting unnamed seedlings. Provided special colors are desired, however, a visit should be paid to a nursery where these plants are grown in quantity during the time they are in flower. Plants can then be selected for Autumn delivery. When special varieties are required they are usually dearer and the advantage lies in procuring reliable plants for single color effects.

Azaleas require moist soil moderately free from lime. It may

be either loam or peat, but when loam is the prevailing soil it is advisable to incorporate a little peat with it at planting time. This is much better than excavating beds 2 feet deep and filling them entirely with peat. Light loam with a little peat added to the top 12 inches forms an ideal soil for this class of plants. Shallow planting must be encouraged, care being taken to give the surface roots every possible chance of spreading. To assist in this, carpet the ground beneath the bushes with half-decayed leaves, and in Autumn rake newly-fallen leaves beneath the bushes, keeping them in place with brush wood until the process of decay is far enough advanced to prevent them being disturbed by wind.

In some places Azaleas are planted as an undergrowth to thin Pine woods, and very beautiful effects are produced by this method of cultivation. Large numbers of plants may be grown for this purpose by sowing seeds collected indiscriminately from mixed plants. They may be sown in boxes and the young plants pricked out in a cold-frame to be placed later in nursery borders for a couple of years previous to placing in permanent quarters. Although the colors of the flowers of different plants are so varied they rarely clash, and there is no good reason for separating the colors. Any variety of special value may be conveniently propagated by layering the branches into sandy soil in Spring.—*Gardening Illustrated*.

The best of all the Kurume Azaleas is *R. Hinamayo*, a plant as yet little known, but now grown in quantity by Van Des of Borkoop. It is a superb little gem, much hardier than *Hinodegiri*, which is common in gardens, and has given me a wonderful display eight years in succession, the whole of the plants being covered with their bright satin pink flowers about May 10.

Speaking of the hardiness of the Kurume Azaleas, the writer of the article you quote concludes his remarks with "as to their suitability for outdoor gardens, there is every reason to believe that they will thrive wherever *Azalea amana* has proved perfectly hardy in the open." Now this is entirely incorrect, and the gardener who is so foolish as to attempt to grow any except the few I have named as fairly hardy will meet with much disappointment.

The cultivation of these Azaleas is an important point. They require a very loose, but good rooting medium. Peat and sand are best, since the plants resent any loam that cakes, the roots being so fine and delicate. Shelter from wind and hot morning sun is also essential and semi-shade. Planted in bold groups as front edge decoration to large Rhododendrons, they will, where they succeed, afford the greatest pleasure to lovers of good things.—*The Garden*.

The Rock Gardens.—The great international show at Chelsea of a few years ago witnessed the inauguration of these on a scale quite without precedent, and if the scale has diminished of necessity during recent years—has been for the moment in comparative abeyance—it has, as a phase, lost nothing of popularity. Today it is a more alive thing than ever before, fascinating thousands by its charms, while impelling admiration from many thousands of others—professional gardeners and laymen alike—who see in them a pleasure affording health-giving pastime of the best. Apart from these things they are a means to an end, showing the way to the betterment of alpine gardening as a whole, and, while giving many of the plants just the help and the positions they need, afford the observer an opportunity of indulging them to advantage. All this and much besides have been demonstrated in these Chelsea rock gardens again and again, and the end is not yet. Great as has been their help in assisting plant lovers to appreciate alpine gardening, they have been immeasurably greater in the true landscape and artistic sense, since they have brought into being a true conception of the right use of stone geologically, have caused all workers in the field to seek out the best, most Nature-adorned classes of rock, and brought about their use in the only true and realistic way. Here, indeed, was one transported again and again to mountain pasture, torrent, or trickling stream, to rock, fern-decked cave, steep declivity, or strong escarpment, each in its way more or less complete. No wonder they fill us with so much delight, or cause us to admire the measure of enterprise—*plus* skill—which have made such things possible. Nor are they all of one kind, as though but one line of thought governed or pervaded all. Rather do they, by variety and diversity, give expression to its most varying phases: the whole of them carefully linked up much of the best which Nature in the past has largely retained for her own, or permitted the mountain climber or student to see now and again. Hence, these rock gardening efforts are not a display merely, not something of today to pass into obscurity tomorrow, but something real, something above all else of an educative and instructive turn, a welcome development in horticulture of the best.—*Gardening Illustrated*.

Cornus Nuttallii.—This is one of its native places, and it grows here to a good-sized tree 30 feet to 40 feet high and in the Spring is a mass of bloom. The average size across the bracts here is 4 inches to 4½ inches, and often they run to 5 inches or more, and it is easy to pick branches 4 feet or 5 feet long with a spread of 2 feet or 3 feet with twenty to thirty flowers open on it. It often flowers again in the Autumn, and is then at its best. The leaves are turning red and pink; the bunches of scarlet berries from the first flowering and the white flowers of the second crop with a cushion of emerald green in the center (these flowers are sterile) make a perfect picture. It resents being moved except when very young, and I find it is best grown from seed and transplanted at a year old. It does not like too much cultivation about its roots, but stands its branches being cut when wanted for decoration. If planted in poor gravelly soil its leaves color best, but it grows slowly. It likes partial shade, and grows well here in mixed woods among Douglas Firs, Hemlocks and Maples, and when near streams with Maples and Alders. It grows taller in moist and good soil, but the leaves do not color so well. Calypso grows wild here, too, and the flowers can be picked by the hundred. At one of the Royal Horticultural Society's shows in the spring of 1917 I was shown one in Mr. Reuthe's exhibit, but it looked very lonely after the woods out here. It grows with the bulb just under the moss with its roots in decaying wood and Fir needles, in woods of Fir with a sprinkling of Maple and where a little sunshine can penetrate. Its scent is fresh and sharp, if one can use that word with reference to a scent. British Columbia is a wonderful place for wild flowers and Ferns, some of the latter, especially *Adiantum pedatum*, being very beautiful and range from a few inches to 3 feet or 4 feet in height.—C. T. Hilton, Port Alberni, British Columbia, in *The Garden*.

The Welsh Poppy in Shade.—The Welsh Poppy (*Meconopsis cambrica*) is so prolific that in many places it becomes a weed if allowed to seed and sow itself; yet there are positions where it is exceedingly valuable, such as under deciduous trees, where it seems to flourish and flower with freedom. For an odd corner under trees or a semi-wild place it does not come amiss and renders such a situation cheerful and bright in May and June, and longer if the seed pods are removed in good time. The shade appears to give a greater softness to the yellow of the flowers and to bring them even more into harmony with the fresh green leaves than where the plants are in sun. Nor does it seem to require much moisture. I have a bank in a dull corner where there is but little moisture and a good deal of shade, and here there are a good many hundred plants which make the corner quite beautiful in its time. It also supplies flowers for cutting, and if taken in the bud stage they last a wonderfully long time in water. Those who do not possess the Welsh Poppy can easily raise it from seeds, sown where the plants have to bloom or in boxes and the seedlings transplanted when small. They will flower next year if sown by early July.—*The Garden*.

Exotic Weeds.—Native weeds, e. g., Couch Grass, Dandelions, Bishop weed, Groundsel, Sorrel (which in Scotland we call Soorocks), and Plantain are quite enough trial to temper and industry without the addition of exotics. Afflicted as I am by the consequence of having in bygone years of much ardor and less experience introduced certain plants to the garden, either purchased from nurserymen or received as gifts from friends, it occurs to me that a word of timely warning may save incipient amateurs from trouble in the future. The subject has been brought painfully home to me by the destruction wrought on a colony of Lady's Slipper (*Cypripedium calceolus*) which has occupied a sheltered bay in a border of shrubs for more than thirty years. There were about a score of clumps which threw up magnificent trusses of bloom May after May until this year, when to my dismay I found not a score of flowering stems all told. Taking advantage of the disturbed state of Europe, Lily of the Valley has invaded the sanctuary and strangled with its matted roots the precious Orchid. Anyone who has striven to remove Lily of the Valley from a place whereof it has taken possession must know that it is no light labor, and that it is well nigh impossible to deliver unhurt such plants as have been caught in the deadly embrace. Some may consider Lily of the Valley as good a thing as Lady's Slipper. Perhaps it is; but my point is that you cannot have both in the same border. *The best place for Lily of the Valley is in the woods; if you have no woods, then give it an isolated border to itself.*

I will now name two beautiful destroyers—*Campanula lactiflora* and the Welsh Poppy (*Meconopsis cambrica*). Woe worth the day when I first planted them with exceeding care, chortling in my innocence at having secured such desirable prizes. Now if I had the last bit of either of them before me in the garden and a good fork in my hand, out it should go. The woodland again is the place for them; in the borders they are as one of the

plagues of Egypt, scattering their seed far and wide. When the seed lands in the middle of some treasure, the seedling produces such long fanlike roots that it becomes impossible to eradicate the robber without uprooting the choice plant also.

The Oriental Poppy is another tyrant that requires strict discipline. We cannot forego its flaming splendor; but it must be kept scrupulously within bounds, else many a fair flower of humbler stature will be crushed out of existence. *Montbretia* and the commoner *Alstroemerias* are terrible spreaders, and should never be planted in a mixed border. I am told that the Indians of South America eat largely of the succulent tubers which *Alstroemeria* produces in such abundance, but when I asked one who had traveled much in that land whether he had tried them as an esculent, he replied that he had not, and so long as he could get a decent potato he did not intend to do so. Sir Walter Raleigh was more enterprising.

Another South American plant, *Erigeron mucronatus*, also known as *Vittadonia triloba*, has established itself as a weed in Europe. The roadside walls at Cintra, near Lisbon, are covered with it, and very gay it makes them with its myriad daisy flowers; but I have cause to rue the day when I inserted a root of it in the wall garden here, for it has spread far, roots so deeply that it cannot be eradicated without pulling down the wall, and goodness knows how many feeble things it has suffocated. *Arenaria balcarica* is also an irrepressible little thug, and should never be admitted to select company.

As for the Knotweeds, the robust members of that most Protean family are enough to drive one to despair. It is fairly impossible to get rid of *Polygonum cuspidatum* and *sachalinense*. All that can be done is to hack down the shoots as fast as they appear above ground.

So much for herbaceous weeds. Among shrubs I have experienced difficulty with two only, which I recommend amateurs not to place among other garden plants. One is a beautiful Rose which came to us under the name of Pink Arches. Nothing could be fairer than its bending sprays laden with shell pink bloom, but it sends subterranean suckers to an amazing distance, to spring up in the midst of things quite unfit to fight with it. The other is *Veronica parviflora* whereof I believe there are two forms, a dwarf and a tall kind. In itself the latter is a very desirable shrub, but it ripens vast quantities of seed. Seedlings spring up in all sorts of places where they are not wanted, and give trouble unless removed while still quite small.—*The Garden*.

The following true story may interest and amuse readers of Sir Herbert Maxwell's note on exotic weeds: Some years ago part of a Rhododendron garden was overrun by *Bambusa palmata*. It took a very strong man, armed with pick and crowbar, just seven days to get rid of it. I asked a very nice clergyman who was going round the garden whether it was right to say "Damn," after the manner of Lord Fisher. "That depends on what you refer to?" "*Bambusa palmata*." "Oh, then I think you are quite justified!" *Erigeron mucronatus* is certainly a weed, but here it never seeds itself except within a short distance of where it has been planted. Also my kind friends always ask for seedlings. The orange variety of *Meconopsis cambrica* never becomes a nuisance; seedlings always come up near the parent plants, which grow under an east wall where nothing else can thrive.

A plant which we designate a weed is, of course, not necessarily a worthless plant ("the Poppies in the corn are lovely"), but it is a plant in the wrong place. My first complaint is against *Helianthus rigidus*, perhaps the most beautiful of the perennial Sunflowers, but a fugitive and a vagabond, ramifying in all directions with its fleshy roots. Another offender is *Thalictrum adiantifolium*, or Poor Man's Maidenhair, very useful for mixing with cut flowers, but an inveterate trespasser. Then there is the common Musk, an old-time favorite as a scented flower but popular opinion has condemned it.—*The Garden*.

The Woodland Tulip.—Grown among the wild Hyacinths and other plants of the woodland, *Tulipa sylvestris* is pretty and graceful without being gorgeous; indeed, it might almost be considered the very embodiment of refinement and grace, with its long and slender stem and deep yellow flowers, so narrowly segmented and sharply pointed at the tips. Instead of the bud of this Tulip being thrust stiffly upright, after the manner of its resplendent relations of garden origin, it droops over with a Poppy-like elegance, the stem gradually assuming the perpendicular as the flower expands. The latter, unlike most of its race, has a pleasant fragrance. *T. sylvestris* appears to enjoy a well-drained soil, and it will do satisfactorily under deciduous trees. In some places it has a bad name for being a shy bloomer, but this is a failing which can doubtless be remedied by a better understanding of the plant's requirements. It is apt to die out or disappear, but those plants which survive—usually in the driest places—bloom every season.—*The Garden*.

Cotoneaster humifusa.—This is the most prostrate of all the Cotoneasters, a plant that rapidly creeps with ruddy stems over the surface of the soil and soon makes a dense mat. The leaves are large, over an inch long, and of a fine Myrtle-green, which is chequered in Autumn and Winter with the yellow and crimson of the few older ones which are shed annually. The flowers and scarlet fruit are small, but as the latter are held erect on long stems they are effective and pretty. *C. humifusa* is a useful plant for covering steep banks or the face of a rock and it does not seem fastidious as regards position or soil. The trailing stems will easily run two feet the first season.—*The Garden*.

BOOK REVIEW DEPARTMENT

The Apple. By Albert E. Wilkinson; 8vo, cloth; 492 pages, with 195 illustrations and 4 color plates; Ginn and Co., Boston.

This book, one of the important new Country Life Education Series, is certainly an outstanding work that in every way deserves to be regarded as a standard. "Deeply convinced of the need of a single volume that would present, in a logical manner, the most essential of the recent practical ideas and methods," the author seems to have succeeded well in supplying the need even for the different apple-producing regions of North America. Throughout his treatment at every point he keeps in mind the superior adaptation of certain varieties to particular localities, soils and sites. He gives good advice to the student, the farmer, the fruit specialist, the middleman and the person who buys for his own consumption. He has drawn exhaustively, but with nice discrimination upon the experiences of successful growers, upon the findings of the prominent governmental experiment stations of this country and of Canada. Particularly valuable is the chapter summarizing investigations that have determined, with a high degree of reliability, the adaptation of the standard and important varieties to particular climates and soils. Another valuable subject, that perhaps ought more to be elaborated upon, though it is treated suggestively enough, is "pedigree trees"; the nurseryman's common practice of obtaining scions from blocks of nursery stock but recently propagated and not from the best of trees that have proven themselves by bearing is evidently, in view of all that has been accomplished by selection in different fields, not commendable. In the treatment of windbreaks it would have been better to give caution against planting soft maples at all near apple trees the roots of which can not compete in their work with the extraordinarily lusty roots of the rapid-growing shade tree. And why should omission be made of the two trees best for the purpose in every way, the red pine and the Douglas spruce? Both of these grow more rapidly than the Norway spruce and are long-lived, as the Norway spruce is not. Then, too, attention might have been drawn to the fact that on many sites the windbreaks might well consist of a row or two of the hardier apple trees that would yield a crop of considerable value while shielding the more tender trees of better quality. Another rather serious shortcoming consists of omitting to treat of the subject of Double Working in the grafting of apple trees. Several varieties need to be handled in this way and experiments just now going on in Europe, seem to indicate that the habit of bearing a crop only in alternate years, which marks some varieties in particular, can be eradicated by budding them upon stocks of kinds not so prolific.

The person intending to plant an orchard of any size would profit by studying the chapter "Laying Out an Orchard," in which is shown, very graphically, the advantages of the quincunx and the hexagonal arrangement over the common method by squares; the superiority of the first methods varies, of course, according to the extent to which use is made of fillers; but the hexagonal method permits the planting of about 15 per cent more trees than does the square system. The chapter Insects, Diseases, Spraying and Miscellaneous Injuries is thoroughly admirable; the one devoted to Renovating Neglected Orchards, that should be of unusual interest in these days, demonstrates that "good business principles applied to a young or moderately old neglected orchard may result in profitable results. A good system of orchard management thoroughly applied will develop wonders from neglected sound trees." The alphabetical list of 88 of the most common varieties, with a short description and evaluation of each, is a splendid feature and, although tastes differ, all judgments here expressed seem to have been formulated with great care. The Baldwin, for example, which not every one would be inclined to say has "very good quality," is pronounced "very good," but several others "very good to best" and some even "best." Such a list obviously can never be quite up-to-date; but a careful reading of it entire helps to rank, with a good degree of probability, the most promising introductions, like the new "Golden Delicous," that appear from time to time.

A LESSON ON THE VALUE OF VEGETABLES

(Continued from page 283.)

diet would undoubtedly tend to save our teeth. In ages past man needed no dentrifices for his mouth, and his teeth were cleaned and disinfected several times daily by the acids in the raw vegetables and roots that were eaten. The teeth of early races, and of the native races of many countries today, were also strengthened and polished by the exercise they got in cracking nuts and chewing fibrous vegetables. All evidences point to the fact that the farther we have got away from a natural diet the more trouble we have experienced from mouth infection and dental decay.

One investigator recently produced proof which appeared to show that the removal of fiber or cellulose from our diet through the refining and cooking processes is tending to reduce the size and number of our teeth. In fact the mouth is becoming more and more merely an opening through which we swallow than an efficient machine for masticating food, and it appears evident that under the conditions now generally prevailing we shall eventually evolve into a race having no teeth at all.

The moderate use of vegetables in the form of pickles, provided the pickles have been prepared without the addition of harmful matter, is no doubt a good practice, as pickling does not entail the loss of any of their vital ingredients. One frequently sees children walking along the street munching a pickle. While we are apt to think that this may not be a very desirable food for a child, it is extremely probable that in eating the pickle the child is obtaining some valuable ingredient or ingredients which are absent from its ordinary diet, and is therefore doing itself good, or at all events less harm than by spending its pennies in some of the kinds of candy that are known to contain deleterious materials.

The economic value of vegetables is not of transcendental importance; it is, however, of interest and worth brief consideration.

The vegetable having the greatest economic value is that which, upon a given area, gives the greatest amount of caloric food at the least cost and in the shortest time.

A couple of years ago some experiments were carried out in England by Dr. F. Stoker, with a view of finding out the different economic values possessed by some of the more popular and useful vegetables. The method adopted was to devote plots of ground of equal areas to each kind experimented with, and to keep an exact record of all expenses in the way of labor, seed, manures, etc.; to observe the period the crops occupied the ground; to weigh the resulting crops and to calculate the actual food each plot produced. Without giving the figures by which the results were arrived at, it was found that the comparative values of the vegetables tested were as follows:

Crop	Yield in lbs. per square perch.	Assimilable calories per perch.	Principally valuable for	Economic value.
Potato	176	73,949	Carbohydrate	69.5
Carrots	392	31,360	Carbohydrate	31.6
Beans (dry) . . .	15	23,325	Protein	28
Peas (shelled) . .	63	26,460	Protein	18
Parsnip	480	19,200	Carbohydrate	15.5
Onion	210	9,450	Oil & Vitamine	4.3
Cabbage	93	1,395	Salts and bulk	3

The following formula was used in making the calculations:

$$\frac{\text{Caloric value} \times \text{Yield in pounds per perch}}{\text{Cost of crop; number of weeks the ground is occupied}} = \text{Economic Value.}$$

It must be understood that the term "economic value" is used in this connection only in the home gardening sense, and has no reference to the commercial production of vegetables for profit.

We must not be understood as advocating vegetarianism pure and simple, as without doubt some animal foods are necessary. Animal foods contain a high percentage of muscle-forming material, but eaten in excess cause an acid reaction in the system and tend to produce many functional troubles. There is more fatigue caused by faulty eating than by hard work and for animal food to do us any good we must consume a sufficiency of properly prepared, or raw, vegetables, which will produce an alkaline reaction to counteract the acid reaction of the meat.

There is, however, considerable room for a great increase in the vegetable part of ordinary diets, and we feel sure that a greater daily consumption of the products of our gardens, especially in the form of salads, and a more rational and less wasteful method of preparing those having to be cooked will not only immensely increase our health and vigor but also prove of great benefit to our pockets, and, conversely, produce the reverse of benefit to the pockets of druggists and doctors.

Protest Against Quarantine 37

Statements regarding Federal Horticultural Board Quarantine 37, Presented at the Horticultural Conference in New York, June 15, 1920

PROFESSOR CHARLES SARGENT

THE Arnold Arboretum is a museum of living plants in which Harvard University has agreed by contract to grow and display every tree and shrub able to support the New England climate. In order to carry out this contract the University has been importing plants and seeds from other scientific institutions and from commercial nurseries since 1874; and for forty years has been carrying on explorations in all parts of North America and in Japan, China, Korea, Manchuria and Siberia. These explorations have been undertaken for the purpose of introducing into this country trees and other useful plants which had been unknown before the establishment of the Arboretum.

The aim of the Arboretum is to increase the knowledge of trees; its museum of living plants growing in Massachusetts is only one of its methods for accomplishing this purpose. It is interested in increasing the knowledge of plants in all parts of the United States and in all foreign countries. Much of its work of exploration has been undertaken for the purpose of bringing into this country and into Europe trees which can succeed only in the Pacific states, Louisiana, Florida, or the milder parts of Europe. For the Arboretum there is no foreign country.

The Arboretum is not charged with having introduced into this country any serious plant disease or dangerous insect on the many thousand plants which have been imported, often with soil at their roots, from every country of the northern hemisphere, or on any of the millions of seedlings which it has raised and distributed. During its entire existence plants have come to the Arboretum from foreign countries except during the autumn and winter of 1919-20. The Arboretum desired to import from Europe a few plants in the autumn of 1919 and received permission from the Federal Horticultural Board to do so on condition that they were sent first to Washington for inspection and disinfection. It was impossible to arrange for the inspection of these plants at Boston; and the Arboretum, having had unfortunate experiences with early importations which had been sent to Washington for inspection by agents of the Federal Horticultural Board, has decided to give up entirely importing plants and seeds until some modifications is made in the methods of the Horticultural Board. As the Arboretum has been active and successful, especially in the last twenty years, in the introduction of new plants into the United States it is believed that its inability to continue this work will be a serious blow to horticultural progress in the United States.

The managers of the Arboretum, in common with every intelligent and public-spirited citizen of the United States, believe in the exclusion of plant diseases and insects destructive to plants; they believe that the methods and rulings of the Horticultural Board can be modified and improved so that the desired results can be obtained without subjecting imported plants to the dangers and delays which it is impossible for them to escape under the existing regulations and methods of the Federal Horticultural Board. Officers of the Government realize that these methods and regulations cause serious delays and the unnecessary destruction of plants, and agree with many importers that these delays and dangers can be reduced by the establishment of inspection stations at ports of entry and by changes in the list of excluded plants. If such inspection stations could be established more prompt and better service would certainly be obtained. Such changes can only be obtained by the active co-operation of every organization and of every individual in the United States interested in the cultivation of plants; and it should, I believe, be the duty of this Convention to urge the necessity of co-operation with the Department of Agriculture in an attempt to obtain changes in its rulings and methods in regard to the importation of plants on which the future of American horticulture depends.

W. C. BURRAGE

THE government, people, horticulturists and horticultural societies of Massachusetts recognize the fact that the United States Government, the United States Congress, the Department of Agriculture and the Federal Horticultural Board are seeking to foster and advance the horticulture and agriculture of the whole country, and that they are not trying to help any one interest at the expense of other interests.

Massachusetts, which is suffering so much from the Gypsy Moth, the Brown-Tail Moth, the White Pine Rust, the Corn

Borer, and other imported injurious plant diseases and insects, and is fearful of others yet to come, surely does not question the principles of Quarantine 37 or the wisdom of the Law of 1912 under which it was lawfully issued.

We do not protest against the law or the quarantine. Still less do we question the motives or intentions of those who framed the law or the quarantine or those who are enforcing them.

We do earnestly protest against what the Federal Horticultural Board, itself, calls its drastic provisions, some of which we maintain are wasteful, inefficient, unsound and dangerous.

We do ask that the regulations of the quarantine and their enforcement shall be reasonable, effective and humane. We do ask that quarantine regulations of the Government, acting for the benefit of the whole people, shall be conducted in the right way. We ask that the United States Government, with all its power and wealth, shall handle the business part of this subject in a business way, the sanitary part in a scientific way, and the human part in a humane way.

Ninety years ago she established the Massachusetts Horticultural Society, which consists of over a thousand members and is truly representative of the horticultural interests of the State.

Nearly 50 years ago, within her borders, was established the Arnold Arboretum, the botanical department of Harvard College; and here a vast amount has been done for the horticulture of the whole country.

And Massachusetts, during a long period, has enacted many laws, seeking not only to improve agriculture, but also to protect and carry forward the science of horticulture in the broadest way.

We want protection against future danger to our horticulture and agriculture and to that of the whole country, but we do not want to be prevented from safely importing those trees, shrubs and plants which do not carry dangerous diseases or insects and which will give assistance, comfort, and pleasure to our people.

In this state, if we find a person who may possibly have smallpox coming into the port of Boston from a foreign shore, we do not send him through the streets of Boston in a crowded street-car and then in a crowded railroad car to a contagious-disease building in the Berkshire Hills, a hundred miles away, in order to determine whether or not he has smallpox, and if he has, to keep him there until he is fumigated and recovered from the disease. We believe that the place to quarantine against dangerous disease is at the threshold, that is, at the port of entry, and we do it here and not in the Berkshire Hills.

We believe that the place to inspect, fumigate, and treat plants is at the port of entry, and we do not believe that it is economical, efficient, safe or justifiable, for example, to send plants from San Francisco, through California, Arizona, Texas, Louisiana, and other states, to Washington, 3,000 miles away, for inspection and treatment, and then to send them back to San Francisco to be put into use. We believe that such a requirement is not only extravagant, wasteful and unnecessary, but most ill-advised—and we do protest against such regulations.

We also believe that the inspection and treatment and the acceptance or rejection of plants should be by high-grade, skilled, experienced inspectors of the Government—not students, but those who can determine what is well and what is ill, what is reasonable and what is unreasonable, in the treatment of plants.

In other words, we do not favor any evasions or violations of the law. We ask that unsound and diseased or infested plants shall be rejected at the port of entry. We also ask that sound, clean plants shall be allowed to come in at one of the large ports and there be inspected, treated, and accepted or rejected, without unnecessary delay, transportation, expense or danger.

We ask that the Government establish suitable inspection services at two ports on the west coast, such as San Francisco and Seattle, one on the south such as New Orleans, and two on the east, such as New York and Boston; and that the final decision upon plants be made at these ports and the plants there destroyed or released, as the case may be.

Finally, we ask that the regulations be revised in a business way and made safe and sound for all concerned.

If it is a fact that the loss to this country from imported plant diseases and insects is over a million dollars a day, then surely the Federal government can afford to pay, and Congress can justly appropriate, the small amount necessary to establish and maintain the inspection services at these ports which may be required in addition to what the government already has there.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

President—L. P. Jensen, St. Louis, Mo.

Secretary—M. C. Ebel, 286 Fifth Ave., New York.

Vice-President—D. L. Mackintosh, Alpine, New Jersey.

Trustees—T. W. Head, Lake Forest, Illinois.

TRUSTEES (For 1920)—Peter Duff, William Waite, Arthur Smith, New Jersey; Robert Weeks, Ohio; W. H. Griffiths, Michigan.

DIRECTORS (To serve until 1921)—William N. Craig, Massachusetts; William Hertrick, California; William Gray, Rhode Island; G. Hennenhofer, Montana; Thomas Hatton, Connecticut; Albin Martini, Iowa; A. C. Jordahn, Florida. (To serve until 1922)—George Wilson, Illinois; James Stuart, New York; William Kleinheinz, Pennsylvania; John F. Huss, Connecticut; Edwin Jenkins, Massachusetts; Carl N. Fohn, Colorado; Joseph Tansey, New York. (To serve until 1923)—Robert Williamson, Connecticut; Robert Cameron, Massachusetts; Theodore Wirth, Minnesota; George H. Pring, Missouri; George W. Hess, District of Columbia; Daniel J. Coughlin, New York; John Barnett, Pennsylvania.

SUSTAINING MEMBERS

New York—George F. Baker, Mrs. R. Coe, Mrs. T. A. Constable, Paul D. Cravath, Mrs. W. Bayard Cutting, Cleveland H. Dodge, Mrs. David Dows, Frank J. Dupignac, Mrs. Coleman du Pont, Childs Frick, W. H. Gratwick, Daniel Guggenheim, Mrs. W. D. Guthrie, Mrs. William P. Hamilton, Mrs. John Henry Hammond, T. A. Havemeyer, Mrs. L. A. Hermann, B. H. Howell, C. O. Iselin, Otto Kahn, W. Eugene Kimball, Adolph Lewisohn, Mrs. Julian McVicker, J. Pierpont Morgan, Mrs. J. Pierpont Morgan, Mrs. Harold I. Pratt, John T. Pratt, E. F. Price, Mrs. William A. Reed, H. D. Roosen, Charles A. Sherman, Mrs. Samuel Sloan, Benjamin Stern, Mrs. W. Stursberg, Mrs. R. M. Thompson, Mrs. Edwin Thorne, Samuel Untermyer, Mrs. Payne Whitney, *New Jersey*—A. Albright, Jr., Charles A. Bradley, Joseph P. Day, James B. Duke, Mrs. Lewis L. Dunham, C. Lewis, Hubert T. Parsons, Mrs. Manuel Rionda, *Pennsylvania*—Gen. Richard Coulter, Mrs. J. D. Lyon, R. B. Mellon, Edward A. Woods, *Delaware*—Irene du Pont, Pierre S. du Pont, *Connecticut*—Dr. and Mrs. Tracy Farnam, George M. Hendee, Miss A. B. Jennings, W. H. Truesdale, William Zeigler, Jr., *Rhode Island*—Gov. R. Livingston Beekman, *Massachusetts*—Harry E. Converse, Mrs. Henry C. Frick, C. H. Hutchins, Mrs. C. G. Rice, Prof. C. S. Sargent, Mrs. J. A. Spoor, *Ohio*—F. F. Drury, Mrs. Francis F. Prentiss, John L. Severance, H. S. Sherman, H. L. Thompson, *Indiana*—Theodore F. Thieme, *Michigan*—E. D. Speck, *Illinois*—Harry B. Clow, A. B. Dick, Mrs. F. W. Upham, *Wisconsin*—F. D. Countiss, *Minnesota*—A. C. Loring, *Iowa*—Mrs. G. B. Douglass, *Missouri*—August A. Busch, *Virginia*—Miss Grace E. Arents, *Kentucky*—F. M. Sackett, *Georgia*—E. H. Inman.

ANNUAL CONVENTION

MARQUETTE HOTEL, ST. LOUIS, SEPT. 14, 15, 16.

Tuesday, Sept. 14.

- 10 A. M.—Executive meeting of trustees and directors.
- 2 P. M.—Convention convenes.
Address of Welcome—Dr. George T. Moore, Director of Missouri Botanical Garden.
President's address.
Secretary's report.
Treasurer's report.
Reports of Committee on Service Bureau Publicity Fund, Committee on Quarantine Bill No. 37, Committee on School Gardens, Committee on Interesting Young Men in the Gardening Profession, and Committee on Co-operation with Federal Vocational Board.
Communications and resolutions.
Consideration of next meeting place.
General discussion.
- 8 P. M.—Illustrated lecture on "Rock Gardens"—Montague Free, Brooklyn Botanic Garden.

Wednesday, Sept. 15.

- 9 A. M.—Address—Hon. Fred W. Pape, Park Commissioner of St. Louis.
Unfinished business.
Nomination of officers.
Subjects for discussion—
Examination for and Classification of Gardeners.
Inducements for Young Men to Take up the Gardening Profession.
- 2 P. M.—Subjects for discussion—
The Threatened Food Crisis: How Can the Gardeners and their Association Assist in Relieving It?
Will Farmerettes Solve the Problem of Help Shortage on Country Estates?
The Sign Board Nuisance Defacing our Highways; How Can It Be Combated Effectively?
General discussion.
- 8 P. M.—Shaw Banquet.

Thursday, Sept. 16.

- 9-9:30 A. M.—Polls open for election of officers.
Unfinished business.
- 10 A. M.—Adjournment for inspection of St. Louis Park System,

and visit to Missouri Botanical Garden and Country Estates.
8 P. M.—Annual Banquet.

Members should communicate with George H. Pring, Missouri Botanical Garden, St. Louis, for hotel accommodations without delay. Members going from New York and vicinity will leave Sunday afternoon, Sept. 12, and should address the secretary for further information as to time of leaving and Pullman accommodations.

Members who cannot attend the convention, and may have ideas or suggestions to be brought to the attention of the convention, should communicate with the secretary at his New York office before Sept. 1.

Amendments to By-Laws.

Notice of proposed amendments is here published as called for by the By-Laws.

To amend Article 2, by adding two sections (Section 7 and Section 8) as follows:

Section 7. Applicants for active or associate membership shall be passed on by a membership committee to consist of the secretary and any two members of the executive board, on whom the secretary shall be authorized to call, to pass on applications. An applicant for active membership must provide the membership committee with a complete record of his gardening experience and references as provided for on the application blanks.

Section 8. The Executive Board, or its authorized committee, shall have the power of refusing to admit an applicant to membership, and shall be empowered to expel from membership any one guilty of unprofessional conduct or other conduct, calculated to reflect adversely on the association. The executive board shall be under no compulsion to give any reason for its action in refusing an applicant to, or expelling a member from the association, either to the individual concerned or to the association.

To amend Article 3, Section 1, by making the dues \$5.00 a year instead of \$3.00 a year as now provided.

To amend Article 3, Section 3, by making dues for life membership \$50 in place of \$25 as now provided.

A MESSAGE FROM OUR PRESIDENT.

Those of you, who have not been able to attend previous conventions may fail to recognize the importance of these events, to your self and the profession at large. Questions of vital importance to the profession of gardening and to you as a gardener are to be brought up and discussed at the coming convention in Saint Louis, and I would like to impress upon the individual member the importance of a large attendance.

We need your personal attention and council if we are going to be successful in solving our problems pertaining to the bettering of our conditions individually and receive the recognition as a body of men, whose service is indispensable to the welfare of our country. A well trained gardener has often, in the past, been regarded as a "Jack of all trades," whose experiences and years of study were considered as of less value than that of less trained men in other professions. The real gardener is worthy of just recognition for his years of study and work, but interlopers have been permitted to usurp their places, at considerable cost to the employers and a subsequent loss to the gardener.

These conditions can be changed only by serious deliberations at the conventions, and really constructive work can be accomplished only when the professional gardener realizes the importance of the issues. It is for this reason imperative that you exert every possible effort to be with us in Saint Louis on September 14, 15 and 16.

By getting out of the everyday run of things, and coming in contact with your fellow worker in the field of gardening, hearing and seeing what is going on elsewhere, you will broaden your vision of your own activities, and enter your work with renewed enthusiasm. For these, and other reasons too numerous to mention, I urge you to go to Saint Louis, and assist in, not only elevating your profession to a higher plane socially, but what is of equal importance, financially as well.

Let us get together and make our meeting a memorable one in the history of gardening and a credit to ourselves and the profession which we represent. I bid you Welcome to Saint Louis.

L. P. JENSEN, President.

Examinations for and Classification of Gardeners.

After considerable discussion which disclosed a divided opinion on the merits of examinations for, and classification of gardeners at the convention in Cleveland last year, the subject was referred to the 1920 convention and the secretary was instructed to secure data from members, organizations and other sources from which a concrete plan can be formulated, to be submitted to the St. Louis convention. Members interested in this subject should submit any data they may possess, or ideas, to the secretary before Sept. 1.

Interesting Young Men in the Gardening Profession.

The association has been successful in interesting a department of the U. S. government in its proposed campaign to attract young men to the gardening profession. It has been assured of national publicity as soon as the association is prepared to place the young men in positions where they can receive proper training. The secretary has gone as far as he can in the matter, and the issue is now up to the country estate owners, their superintendents and gardeners to provide places for these young men who may desire to make gardening their life work. The secretary is eager to hear from those who will co-operate with him.

Sustaining Members

Cleveland H. Dodge, Riverdale, N. Y. (George Norris, gardener); C. Oliver Iselin, Glen Head, L. I. (Fred Falconer, superintendent); Mrs. Harold I. Pratt, Glen Cove, L. I.; Mrs. John Henry Hammond, Mt. Kisco, N. Y. (John J. Connolly, gardener); Mrs. J. A. Spoor, Pittsfield, Mass. (John Johnson, gardener); Charles A. Bradley, Convent, N. J. (Robert Crighton, gardener); Mrs. F. A. Constable, Mamaroneck, N. Y. (James Stuart, superintendent); Mrs. F. F. Prentiss, Cleveland, Ohio (R. P. Brydon, superintendent); Mrs. Lewis L. Dunham, Madison, N. J. (Ernest Wild, gardener); A. B. Dick, Lake Forest, Ill. (Frederick W. Sparks, superintendent); A. Albright, Jr., Maplewood, N. J. (William Barron, gardener); Mrs. Coleman du Pont, Great Neck, L. I.; Mrs. William P. Hamilton, Sterlington, N. Y.; Benjamin Stern, Roslyn, L. I.; Mrs. Julian McVicker, Larchmont, N. Y. (Joseph Meckel, gardener); Otto Kahn, Woodbury, L. I.; Pierre S. du Pont, Wilmington, Del. (William Mulliss, gardener); Prof. C. S. Sargent, Brookline, Mass.; Hubert T. Parson, West End, N. J. (H. L. Crane, superintendent).

AN APPEAL FROM A FELLOW MEMBER.

In reading the July number of the GARDENERS' CHRONICLE, I was astonished at the small number of sustaining members recorded from some states. Why, I cannot get over it, to see Wisconsin represented by only one, and Illinois by only two! What's the matter with Lake Geneva? What's the matter with Lake Forest, and the neighbors along the North Shore?

There are plenty of opportunities for the gardener to have a heart to heart talk with his employer and if you boys—excuse the familiarity but we know each other so well—if you boys, put it up to your employer in the right form and explain how anxious we are as a body of professional gardeners to elevate our profession to its proper level, your employer will not fail to sustain you and become interested in the work that is being done. But it requires concerted action. Don't expect George to do it. His name, by the way, isn't George—but M. C.

I am also reminded just now of the "Point of View of the Professional Gardener" so very ably explained by William N. Craig in an address to the members of the Garden Club of America. Many members of this club are your own employers and can easily be induced to become interested in our cause, if you yourself take the initiative. My own present employer thought Mr. Craig's article very worthy and timely, and brought me her own garden magazine to read it! So my worthy colleagues of personal acquaintance, I would ask you to get the good will of your employer for our cause, for I cannot believe that you have tried and have been refused.

Brucemore, Cedar Rapids, Iowa.

A. MARTINI.

New Members.

The following new members have been recently added to our membership list: Paul Krietz, Lake Geneva, Wis.; F. W. Silcock, New Windsor, N. Y.; Richard J. Black, Waterville, N. Y.; Murray Scott, Omaha, Neb.; George E. Last, Englewood, N. J.; William T. Robinson, New Rochelle, N. Y.; H. Erickson, Port Jervis, N. Y.; Thomas Eastham, New York City; Cecil H. Halpin, Hyde Park, N. Y.; James Lyon, Yonkers, N. Y.

Service Bureau Publicity Fund.

The following contributions have been received towards the Service Bureau Publicity Fund up to July 31:

Previously acknowledged.....	\$1,372.00
Kenneth Cedarman, Port Washington, L. I.....	2.00
Peter Morrison, Southampton, L. I.....	3.00
J. C. Armstrong, Louisville, Ky.....	5.00
Charles Milburn, Suffern, N. Y.....	10.00
Alexander White, Ardsley, N. Y.....	5.00
Total.....	\$1,397.00

NEWPORT BRANCH, N. A. G.

The local branch of the N. A. G. held a meeting on May 28th. After due consideration and general discussion it was voted not to encourage holding a conference in Newport this Summer, as it is the sense of the members that not much would be gained by it, and that not until local branches are formed in different parts of the country can there be that co-ordinated effort which the association stands for. We would therefore respectfully urge that our able secretary preach this doctrine whenever and wherever opportunity offers.

A committee of three was appointed to consider the training of young gardeners and the question of certificates and report at the next meeting.

A. L. D.

AMONG THE GARDENERS.

D. L. Mackintosh, for the past six years superintendent of the gardens and farm of the Minnesota State Prison, Stillwater, Minnesota, has accepted the position of superintendent on the estate of Manuel Rionda, Alpine, N. J.

Albert Jay, who for the past fourteen years has been in charge of "Seal Cove," the estate of Charles E. Mason, has secured the position of superintendent on the estate of Mrs. Henry C. Frick, Prides Crossing, Mass.

Frederick Lagerstam, gardener of the John A. Topping estate, Greenwich, Conn., for the last eight years, accepted the position of gardener on the estate of Edw. F. Albee, Larchmont, N. Y.

Henry J. Moore resigned his position with the Queen Victoria Park System, Niagara Falls, Ontario, to accept the position of Forester of Public Highways with the Ontario Government.

Henry T. May has secured the position of superintendent to W. J. Myers, Springfield, Ohio.

William Fischer secured the position of superintendent to E. S. Burke, Chagrin, Ohio.

James Donald succeeded Henry T. May as superintendent of the Mrs. A. A. Bradley estate, Hingham, Mass.

Alexander Thomson secured the position of head gardener on the Claylugh estate, Mt. Kisco, N. Y.

Joseph Meckel secured the position of gardener on the Julian McVicker estate, Larchmont, N. Y.

W. H. McDonald secured the position of gardener on the estate of Mrs. Arthur Lee, Elkins, West Va.

George Bell, for the last three years gardener of the F. L. Stetson estate, Sterlington, N. Y., has accepted the position of gardener on the estate of John E. Brandeis, Omaha, Neb.

Paul Hamer has secured the position of superintendent on the estate of Charles H. Candler, Atlanta, Ga., which is under course of development.

Robert Ross Moss has been appointed superintendent of Oakwood Cemetery, Warren, Ohio.

Murray Scott has secured the position of gardener to George Brandeis, Omaha, Neb.

Thomas Kennelly has accepted the position of superintendent on the estate of David Dows, Brookville, L. I., succeeding Henry Gibson.

J. Malcolm McAllister resigned his position on the estate of Mrs. Gustav E. Kissel, Morristown, N. J., to accept a position of florist of Exotic Gardens, Miami, Florida.

Daniel MacLennan secured the position of gardener to Daniel Tatum, Glen Cove, L. I.

Charles Milburn secured the position of superintendent of Pelham Farm, the estate of H. P. Robins, Southampton, L. I.

Sydney G. Tranfield resigned his position as gardener on the Gail Borden estate, Larchmont, N. Y., to accept a similar position with Conrad Hubert, White Plains, N. Y.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Here and There

EUONYMUS RADICANS.

Euonymus radicans is the only evergreen climbing plant really hardy in this climate which can attach itself firmly to stone, brick or concrete walls. There are a number of varieties of this variable plant in cultivation, and the handsomest of them is the broad-leaved form from northern Japan, known as var. *vegetus*. This plant can grow in Massachusetts to the eaves of a tall house and completely clothe its walls with a cover which grows thicker by an annual shortening of the branches, or if a wall is not provided for it to cling to it will grow as a low round-topped dense shrub. Like the other forms of the species it can also be used to cover the ground under trees and shrubs, but as a ground cover it is improved by occasional clipping.

This variety *vegetus* is now covered with its small yellow-green flowers which will be followed by abundant pink fruit, which adds greatly to the decorative value of this variety which is the only form of *E. radicans* which has flowered in the Arnold Arboretum. The extreme cold of two recent Winters injured the leaves on many plants of this var. *vegetus* in eastern Massachusetts, but the wood was not hurt and the branches were soon covered with a new crop of leaves.

EFFECT OF LIGHT ON PLANTS.

The information that government experts are accused of giving out, as a result of experiments by them, "That plant life depends more on light than temperature" and the discovery of this law will revolutionize the culture of plants especially under glass, is not likely to cause greenhouse men to scrap their heating plants or even ease their minds about their future coal bills.

Possibly the Government experts have discovered something hitherto unknown, but in presenting it to the unsentient public have not guarded against the sensational presentation of their discoveries.

As a cub at Kew Gardens the writer well recalls the damage done to the tender exotics in the stove house by two continuous weeks of London fog. Each morning more leaves came off or turned yellow until pot and stems seemed more conspicuous than foliage. He also recalls the controversy about tinted glass. The scientific men decided glass of a green tint was the right thing with which to glaze the large Palm house to prevent the Summer sun from scorching the plants. Later science proved it was the worst color they could have used, and that clear glass was the best.

Nature seems to have a fair idea what she wants and the limits or laws governing her needs are fairly well known. It does not take a very experienced greenhouse man to know when the temperature has fallen too low in the houses under his care during the night, and it is just as obvious by the effect on the plants when it gets too high.

Light, heat, moisture and food are all necessary to the growth of plants. The

proportion must necessarily vary with each kind of plant.

A brief study of Geographical Botany will reveal the type of plant Nature has produced under different conditions. The cactus or that type plant that presents the least surface to the sun will be found to dominate in the localities of intense sunlight and little moisture. In the more humid or cloudy portions of the earth, the type follows along that of presenting the greatest surface to the light, but moisture and temperature seem to be the great dominating factors in the growth of plants, providing there is enough light for them to function.

My observations have not been made



Putting In Our Oar About Orchids

Sometimes I think that there is more sense, that is sheer nonsense; than there is sense, that is common sense.

Take orchids for example.

What a lot of bunk you hear about how seedlings grown in this country are not a success.

Sure enough, many are not.

Growing seedlings takes sense. A rather uncommon variety of common sense.

So do French Hydrangeas.

Still most folks admit we are growing just as fine ones as ever were chucked under the chin by a Frenchman.

For the last six months our orchid seedlings have been in flower.

The prices have always averaged higher than species. Buy a few seedlings each year, and by the time the species are exhausted you will have a fine lot of the seedlings to fall back on.

Be uncommonly sensible and act on your common sense.

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2½-3' High—2½-3' Spread
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Write for price list and varieties for shipment latter part of August and September.

FOR OTHER TREES AND PLANTS WRITE FOR OUR PRICE LIST

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scientifically but sad experience has taught what absence of sufficient light will do to growing plants and I have failed to note any appreciable difference in the growth of plants growing in the vicinity of electric arc lights. Until we get more information we shall have to follow old practices to enable us to pay the taxes to carry on the experiments.

Whatever may be the results of scientific experiments made by experts, the practical grower who has lived with his plants night and day, year in and year out, comes pretty near knowing to a nicety the effects of light and heat on the various plants under his care.—*The National Nurseryman*.

CHOICE OF LILACS.

Hardly a week passes without a letter addressed to the Arboretum asks for the names of the best, or of the best six or of best twenty-five Lilacs. There are now one hundred and fifty named forms of the common Lilac in the collection. They are all or nearly all handsome plants, and no two persons ever agree about their individual value. Some persons prefer flowers of one color and other persons prefer flowers of another color; some persons like the Lilacs with double flowers and others detest them. All the forms of the garden Lilac have practically the same habit and foliage, and the same inconspicuous fruit; they all bloom freely nearly every year, and breeding and selection have not affected their perfume as it has that of so many much "improved" plants, like many of the modern Roses. There is considerable variation in the size of the individual flowers; the double flowers open generally a little later than the single flowers and last longer, but there is really little difference in the time of flowering of all these plants. The size of the flower cluster varies somewhat on the different forms; it is larger on young plants than on old ones, and it can always be enlarged by severe pruning which increases the vigor of the flower-bearing branches. Choice therefore depends on color, and really none of these Lilacs are "best" for everybody; one color or one shade is "best" for one person and another color or another shade is "best" for another person. Many persons who come to the Arboretum find the old Lilacs which have been growing on Bussey Hill for nearly a hundred years more beautiful than any of Lemoine's recent creations because they are the Lilacs which have long been common in old New England gardens and beloved by generations of New Englanders. A choice of Lilacs being largely a matter of taste in color or of association.—*Arnold Arboretum Bulletin*.

TRANSPLANTING.

Transplanting is most successfully accomplished after a rain, during cool cloudy weather, also just before a rain. At any event the ground should be moist for the best results.

If transplanting is in hot weather, late afternoon or evening is the best time. In this way the plant may have time to strengthen up before the hot sun hits it the following day.

If the season is very dry the plants may be watered; after the water has soaked into the soil, dry dirt should be placed around it, preventing the evaporation of moisture, and preventing the soil from baking. This dry dirt forms a mulch.

Only the most vigorous and well-formed plants should be used. There should be enough plants that a selection can be made. Thin, slender, soft plants should always be discarded.

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DREER'S

HARDY PERENNIAL PLANTS SPRING FLOWERING BULBS

The Fall is an excellent time to set out Hardy Perennial Plants, Vines, Shrubs, Roses, etc. We make a specialty of these plants and grow in large assortment. A complete list will be found in our AUTUMN CATALOGUE, also Spring-flowering Bulbs which must be planted this Fall for blooming next Spring.

A copy mailed free to anyone mentioning this publication.

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Plow deep, and pulverize the soil. When transplanting keep the plants out of the sun.

The stems as well as the roots should be kept damp to prevent evaporation. Broken or withered leaves and branches are removed from the plant as it is planted.

Plants should be set deep. They have a better chance to absorb moisture when set deep and have a better root system. Firm the soil well around the plant. This will prevent evaporation.—*Farm Life*.

A SOUTH AFRICAN FLOWER.

Flowering at the Cape of Good Hope all through the Winter is one of the most beautiful flowers in the world, which has been called the queen of the South African flora.

This is *Strelitzia*, with leaves like those of a small banana and flowers so magnificent in color, form, and size that soon after its discovery it became one of the wonders of the flower world. It is along the river banks of southeast Cape Colony that it may be seen at home, standing up some four feet among the grass and scrub that clothe the edges of the water. Open glades are also sometimes ornamented by scattered tufts some way from the valleys, but nowhere else in the world is it truly wild. So it is an endemic. The flowers spring one after another all through the season from the beaklike summit of the stem. In each there are three deep yellow sepals 4 to 6 inches long which stand upright like the crest on the head of a parrot. Among them are the dark blue petals combined together around the stamen into the shape of an arrow. The whole bears a striking resemblance to the head of a large and gorgeous bird with its blue and yellow crest erect and its beak pointing forward. The likeness is further helped by the flower stalk, which curves like the neck of a swan. The stamen is normally completely hidden by the petals, but it is revealed when a honey gatherer visits it, as they open down the middle when pressed from above, closing again to protect it as soon as the weight of the visitor is removed. Rather more weight is required than that of a bee, and it has been noticed that these flowers are visited and pressed open by the little sugar-birds and sunbirds.—*Exchange*.

FLOWERS WITH EXTRA PARTS.

A correspondent writes that a Chicago iris grower has a plant of the form known as Madam Chereau with four parts in each whorl, instead of the conventional three and asks how such multiplication of parts is brought about. In reply, it may be said that plants of this kind are "sports" and may occur in practically any species with a

TALL BEARDED IRIS



Growing in the Exhibition Grounds of the
Van Wert Iris Gardens

"When one admires, late in May or early in June, the gardens of those few people who have had their places planted under the direction of good landscape gardeners, one sees pictures made up largely of three types of flowers: Irises, peonies and Darwin tulips. These are the types that have the greatest picture-making possibilities among the easily grown hardy perennials, and so they are utilized by experts in landscape picture making."—*Clarence Moores West*, writing in *The House Beautiful* for September, 1919.

A complete descriptive catalogue, listing distinctly and accurately, several hundred varieties, including all the finest of the old and most of the finest, newest and rarest of recent American and European origin, is now ready. Write at once to secure a copy.

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definite number of parts in a whorl. The trilliums are often found in this condition and in the editor's grounds a race of four-parted Darwin tulips has been bred up from a single bulb that produced flowers with this characteristic. How to produce such sports is difficult to say. Those in commerce are commonly the result of chance finds and were not the object of experiment by the breeder. If one deliberately sets out to produce such "freaks" he would be most likely to succeed if he varied the surroundings of his plants as much as possible. No plant is perfectly adapted to its locality. It does the best it can under the circumstances. When it is brought into a new region, therefore, it naturally begins to adapt itself to the new conditions, and in this effort sports are often produced. In general, any change in the plant's environment—air, soil, water, light, or tempera-

ture—is likely to result in more or less definite responses of the plant which may be sufficiently strong to make noticeable differences in its form.—*American Botanist*.

HOW NATURE PLANTS TREES

The reproduction of trees is an interesting study. While many species are easily and more quickly grown from sprouts or cuttings, yet the natural method, the way in which our forests originated and are maintained is by seeds. As a rule all trees bear seeds and "within the seed the tree in miniature already lives." The seed falls to the ground and if conditions are favorable, in due time germinates; first the tiny rootlet reaches downward into the earth, then a slender shoot pushes upward into the light and air. Such is the beginning of tree life, and slowly or rapidly, according to its kind,

the little seedling grows toward maturity.

The way in which Nature provides for the sowing of the innumerable seeds borne by the trees varies greatly with character of the seed and the time of ripening, but the wind is the most common distributing agency—the great sower of tree seeds. In order that the seeds may be carried long distances, instead of falling directly beneath the parent tree where there is no room to grow, many trees produce winged seeds or seeds encased in tiny paperlike balloons. The wind blowing through the treetops detaches the seeds from the parent stem and scatters them far and wide.

Of the trees producing seeds with wings the maple is a familiar example. The maples are prolific bearers, some, like the soft maple, ripen their seeds in early Summer; others, like the sugar or hard maple, mature in Autumn and often cling to the branches long after the leaves have fallen. The seeds of the elm and birch are provided with filmy rims and those of the hop hornbeam are encased in tiny inflated balloons. Seeds of this character are carried long distances by the wind.

In the settled country where the land is under cultivation, only the seeds that chance to fall in fence corners or along the road side have any chance to grow, but in large forests or forest openings they spring up by the millions and where grazing is not allowed the young seedlings quickly possess the land. One frequently sees in the early Spring whole gardens or plowed fields in the vicinity of trees thickly covered with self-sown little tree seedlings which are destroyed as soon as cultivation of the soil begins. If these fields and gardens were left uncultivated for a few years they would be transformed into young forests.

In the case of nut-bearing trees and fruit trees other agencies than the wind are necessary for distribution of seed. With the first named the squirrels play an important part, often carrying the nuts long distances and burying them here and there in the ground or hiding them in stone walls for further use. These are often never used by their harvesters for one reason or another and so germinate and grow. In the case of many kinds of fruit-bearing trees the birds are the seed sowers. With both fruit and nut bearing trees, standing on low lands or near large streams the Spring freshets often act as seed carriers, floating them long distances downstream and as the waters subside depositing them here and there to begin the miracle of life and growth.

Thus Nature persistently carries on the work of tree reproduction. Lavishly do the various species bear seeds, and with an equally lavish hand are they scattered far and wide over the land. Were it not for the destructive activity of man our cleared lands would soon be covered with trees as of yore and our forests would regain their original density of growth.—*Tree Talk*.

FLOWERS AND SEX.

The commonest form of flower is that in which both stamens and carpels are present: in fact, this is regarded by the unbotanical as the only kind of flower. When any extended study of these structures is made, however, two other types usually appear—the monoecious, in which the stamens and carpels are separate and borne on different parts of the same plant, as in corn and the pines, and the dioecious, in which the two forms of flowers are still further separated by being borne on different individuals, as in willows and poplars. While these are the most conspicuous, there are numerous other forms among which may be mentioned perfect and staminate

flowers on the same plant, as in some *Umbellifera*; perfect and carpellate flowers on the same plant, as in *Atriplex* and many *Compositae*; separate plants with carpellate, staminate, or perfect flowers as in some maples; separate plants with carpellate and perfect forms as in *Plantago lanceolata*, and separate plants with staminate and perfect flowers as in *Caltha*. There are also all gradations from completely perfect flowers to flowers that are either staminate or carpellate. Ten different forms have been found in the ash. According to a writer in the *American Journal of Botany*, more than ninety families of plants have species that show differences of the kind mentioned.—*American Botanist*.

SOBARIAS.

The Sobarias are better known under the name of *Spiraea* and the one most commonly listed in the catalogues is *Spiraea sorbifolia*.

They are a handsome genus of flowering shrubs and it is really a wonder they are not more often met with in shrubbery plantings.

Burpee's Sweet Peas

THE Burpee list of Early- or Winter-flowering Spencer Sweet Peas contains the finest varieties yet to be offered in a complete range of colors. In addition to the usual colors we have some beautiful shades of pink, salmon, orange, cerise and true blue. Plant some BURPEE'S SWEET PEAS for winter blooming in your greenhouse now.

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HAMMOND'S PAINT AND SLUG SHOT WORKS, BEACON, NEW YORK.

The planter is usually concerned more about a plant's general appearance and time of flowering than botanical differences. Some of the points in their favor that should commend them to the gardener are: They are adaptable and vigorous in their growth, sometimes too much so, as they spread rapidly by means of suckers when the position suits them. They flower during the Summer when there is a dearth of bloom on the average shrubbery borders. A moist, partially shaded position suits them, and it is often difficult to select a shrub for such a place that will be so much at home. The foliage is rich and handsome.

The one fault, if it be a fault, is the unsightly appearance of the dead panicles when the bloom is past. These, however, are easily removed which gives the plant a longer season of good appearance than most flowering plants.

The different kinds are all much alike in habit but flower at different times. The first to bloom is the *Sobaria sorbifolia*, which comes in June, followed by *S. stipellipilla*, *S. asurgens*, *S. arborescens* and, last of all, *S. Hitchinsonii* in September.—*National Nurseryman*.

THE JOYS OF A GARDEN POOL.

There is no need to plead the merits and joys of a garden pool. They are everywhere acknowledged, and every one has a pool who can afford the cost or the water. Growing aquatic plants is but one of the pleasures. Would that our flower-beds could be so beautiful in their surface and appealing in movement, so satisfying, in short, whether the flowers grow or not!

The structural design of a pool is not a difficult matter. As a piece of engineering, it is simple so long as the pool is full of water. If it be emptied, then the walls of the pool become a retaining-wall and must be designed to resist earth-pressure, and, if it be in low ground, possibly hydrostatic pressure.

The pool, however, presents a difficulty in that it must be water-tight, so that a movement of the walls which would pass unnoticed in a terrace wall will produce cracks which are sure to leak. This is most likely to happen if the pool be empty in Winter, when the pressure of the frozen ground will inevitably crack the walls by moving them slightly inward. Leaving the pool full of water through the Winter usually prevents this damage, since the ice-pressure is equalized by the ground-pressure outside and the ice buckles or slips on the side of the pool until the outside and inside pressure are practically the same.

It has been our invariable experience that damage happens only when pools are emptied in the Winter, and that pools with water in them never come to harm so long as the water-level in Winter and the ground level are the same.—*Landscape Architecture.*

MEMORIES OF YESTERDAY

My garden draws its bloom from many climes—

Lilies from Spain; red roses bred in France;

White daphne, redolent of old romance,

From Grecian groves; slim, silver-tassled limes

From quaint Dutch highways; Canterbury chimes

From Sussex hollows; quinces from Japan;

Wild honeysuckle from far Ispahan, And Tuscan almonds famed in Petrarch's rhymes.

And strolling down the bordered pathways, sweet

With fragrances so many winds have blown,

Is like a glance through diaries, replete With chronicles of happy moments known In distant lands—each blossom fresh and gay,

Marking some memory of yesterday.

CHARLOTTE BECKER, in *Life*.

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Ever wished you had some sort of a book that told you in a right to the point way just what to do when you wanted to do some painting, varnishing, enameling or staining?

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Ever wished you knew the kind of floor paint or varnish to use on old floors and the best way to treat a new one?

Ever wished that some one would write a little book about just these things and do it in an interesting, chatty kind of way, so you could find out the things you want to know and be told those you ought to know?

In short, you have wished over and over for a book that would take the perplex out of paint perplexities.

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He tells it to you just as if he were sitting right here by you and having a friendly chat.

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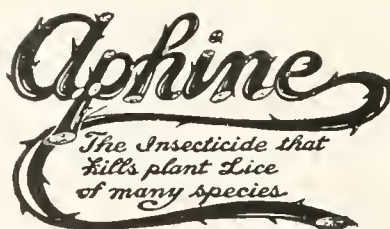
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Andrew Rodgers, Gardener,
estate of Mrs. Ethel D. Mellor



View of avenue and house on the estate of Mrs. Ethel D. Mellor, Plymouth, Mass.
Note work done on several of the trees

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Your men are real live wires and professionals in the true sense of the word.

Admitting that it is up to every gardener to secure the very best seed and nursery stock in order to insure giving satisfaction in his crops, flowers and shrubs, is it not logical then that the wonderful specimen trees should have the attention of the highest authorities? Experts trained only for this particular business should always be the first consideration. The very best is not too good, but a doubtful proposition is dangerous to recommend to any estate owner.

Your treatment on the trees here will stand any investigation.
With all good wishes

Sincerely yours,

(Signed) Andrew Rodgers
Gardener to Mrs. Ethel D. Mellor.

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This tree was treated and restored to health in 1917. Note how concrete has been placed in the cavity, section on section, to allow for swelling and prevent cracking. Note also view of Pilgrim Monument in the background.



JOHN DAVEY
Father of Tree Surgery

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(OF AMERICA)

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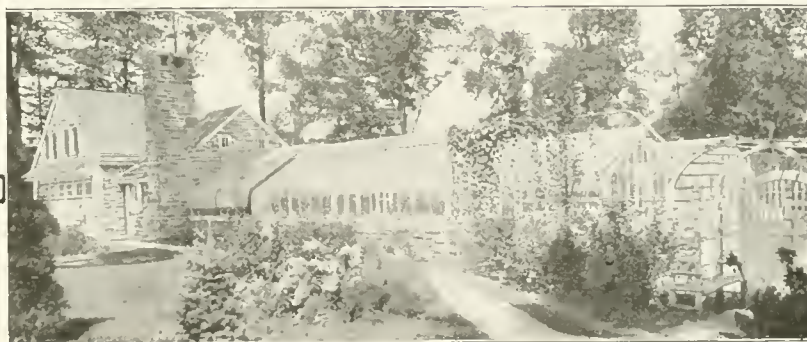
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

NEW YORK
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Things and Thoughts of the Garden

MONTAGUE FREE

WHEN travelling around the countryside in New England and New York during August the prevailing note of color amongst the wild flowers seems to be rose or purple, with a hint of yellow to come occasioned by the blooming of precocious goldenrods.

The rose color of course is given by the "Hardhack" or Steeple Bush, *Spiraea tomentosa*. One wonders why this beautiful shrub has not been taken in hand by the plant breeder and improved for garden purposes. Many no doubt will say, with truth, that it is already sufficiently beautiful to be worthy of admission to the garden, but there is room for improvement, as in most of our garden flowers, by way of greater purity of color and size of flower truss. There is considerable color variation to be seen in the flowers of those growing wild and also in the size of the inflorescence, and probably simple selection of seed from desirable plants without recourse to hybridization would result in an improved product from a garden standpoint. The "Hardhack" grows naturally in moist ground and it is in such situations that it flourishes best when brought under cultivation. Unlike most flowers the buds at the top of the inflorescence open first. The flowers as they fade lose their rosy color and become a greyish white which gives a harmonious gradation down the spike to the unopened flower buds at the base which are of a delicate buff color.

* * *

The most showy of the wild flowers occurring at this season is, undoubtedly, the "Fireweed," *Epilobium angustifolium*. This when seen in large patches is a wonderful and gorgeous sight. And its display is not finished when the flowers fall as these are succeeded by the opening seed pods which exhibit the seeds clothed with fluffy, silvery, fibres which give the plant an entirely different appearance. In spite of its beauty it is only with reservations the "Fireweed" can be recommended as a garden plant. It is extremely aggressive, spreading by means of seeds and underground runners and is difficult to control once it has become established. An example of its tenacity of life and also of the daring color combinations sometimes affected in Nature was witnessed recently on a farm in the Catskills. A piece of ground had been plowed and for some reason or other left unplanted. Practically the only survivors on this plot were the "Fireweed" and the Orange Hawkweed, *Hieracium aurantiacum*, another beautiful, but pestiferous, weed. Few gardeners would dare to combine such colors as the red-orange of the Hawkweed with the purple, almost

one might say magenta, of the "Fireweed" and yet when seen growing wild massed together the result was harmonious. Such a combination reminds one of another of Nature's bizarre color schemes in the blue-purple and orange of the Bird-of-Paradise Flower, one of the most arresting of our greenhouse plants when in bloom.

* * *

About this time last year the writer was one of a party engaged in collecting alpine plants from the summit of Mt. Washington—permission being granted by the Forest Service to obtain a limited number of each species. The object of the expedition as far as the writer was concerned was to add to the collection of rock and alpine plants at the Brooklyn Botanic Garden with the hope of discovering the species amenable to cultivation and worth while from a gardening standpoint. The work of collecting had its discomforts and compensations. One day, for instance, it was bitterly cold, raining hard, with a howling gale and a fog so thick that it was impossible to see anything that was more than about fifty feet away. Imagine what it would feel like to be sweating and panting up the trail in weather of this description with a sack of heavy, soggy, plants on your back, with soil in your ears, and cold water trickling down your neck! But the compensation came with a wash, a change of clothes, a pipe of tobacco, a seat in front of a log fire at the Summit House and the knowledge that a good haul of specimens had been made. And then the following day of glorious sunshine when one could see the grandeur of the bleak desolation where these alpine plants have their home caused all discomforts to be forgotten.

The growing season at this time (September 1st), was practically over so far as the plants above timber line were concerned and they were just about ready for their Winter's rest. This brought about a serious cultural difficulty, as, on their removal to New York they experienced a warm spell with temperatures up to 90° and in consequence many started to push out new growth which was quite unfitted to stand the Winter that was so shortly to descend upon them. However, quite a number pulled through satisfactorily. This unseasonable growth could probably be prevented by placing alpine plants collected in the Fall in pots or flats and keeping them in cold storage until the following March when they could be planted out-of-doors.

About thirty species were collected some of which are only of scientific interest. It is too early to say def-

initely as to the value of these plants for rock gardens at low altitudes with high Summer temperatures—some are very promising. The "Mountain Cranberry" *Vaccinium litis-Idæa* var. *minus* seems to stand our conditions well. It is dwarf, evergreen, about four inches high, with shining coriaceous leaves. *Geum Peckii* a species with bright yellow flowers; the "Mountain Sandwort," *Arenaria grænlandica*; a mountain variety of "Bluets," *Houstonia carulea* var. *Faxonorum* having pure white flowers with a yellow throat; and several species of dwarf Willow are thriving quite satisfactorily. The latter when growing above timber line hug the ground closely but when given less rigorous conditions they have a tendency to aspire and we have some that are five or six inches high.

Among the interesting plants collected was the "Lapland Rose Bay," *Rhododendron lapponicum*, a prostrate evergreen with bright purple flowers. A most deceiving plant to dig up as the roots are out of all proportion to the size of the top and usually extend in un-get-at-able positions between the rocks. The plants of this bloomed fairly well last Spring—some have since died but there are good prospects for establishing a few. *Diapensia lapponica* will probably prove amenable to cultivation if coddled. We have plants that have survived a Summer and a Winter. It is a typical alpine "cushion" plant forming mounds of tight rosettes spangled in Spring with solitary white flowers an inch in diameter. Ericaceous plants collected in addition to those already mentioned were the "Alpine Azalea," *Loisleuria procumbens*, small rose-colored flowers; "Labrador Tea," *Ledum grænlandicum*; *Phyllocladus carulea*, purplish flowers; and *Cassiope hypnoides*, a dwarf moss-like plant with flowers of white or rose color. All of these are evergreen. They are very interesting botanically and horticulturally too—if they can be grown without too much trouble. The *Cassiope* is probably too "miffy" but the others are likely to succeed especially when we know more of their requirements. One plant found in great abundance is *Potentilla tridentata*. This, which is not by any means restricted to alpine summits, is a good rock garden plant and will thrive almost anywhere.

* * *

When looking over a list of "really truly" alpine plants that are cultivated in our rock gardens one finds that most of them are of European origin. This is partly due, no doubt, to the European alpine flora being richer in ornamental species than the N. American and to the fact that in Europe more attention has been paid to this class of plants, which in consequence have been taken up by the trade and thus made more accessible. But for all that it provides an interesting commentary on our lack of appreciation of floral treasures which are comparatively close at hand. Where can one obtain the gems of the Rockies except by the process of "Go get 'em?" Such plants as *Erythronium grandiflorum*, the Snow Lily; *Ranunculus Eschscholtzii*, the Snow Buttercup; *Aquilegia flavescens*; *Delphinium Menziesii*; *Dryas Drummondii*; the choice Pentstemons and the Androsaces and Primulas, all good rock garden subjects, where can one get them? I have been unable to find them in any catalog even of those who make a specialty of native material. There is a Colorado nursery that lists a few Rocky Mountain plants, but many more must be added to make the list truly representative. Many lovers of horticulture have long been urging the use of native plants as landscape material with good reason. Is it too much to hope that, with the increasing interest in rock gardening coupled with the difficulty of obtaining suitable plants from Europe, our own alpine flora may soon find its way into our gardens?

Perhaps it is permissible to return once more to the subject of the English sparrow. A couple of months ago use was made of a quotation from a contemporary to the effect that a British Experiment Station had demonstrated that sparrows and other common birds had a horror of blue paper and that it might be a valuable method of protecting gardens from pests of this kind. Since then I have had an opportunity of seeing it put to the test. The partner of my joys and sorrows, who is head gardener of our backyard and the Morello cherry tree therein, noticed that the robins were helping themselves to the ripe cherries. As she honors me by reading these monthly lucubrations the item concerning the new "scare-sparrow" was brought to mind and acted upon. In consequence, on returning home one evening, I was greeted with a vision of the cherry tree tastefully decorated with blue paper streamers. The result was according to expectations. The robins treated the paper with absolute contempt and continued taking toll of the cherries; while as far as the sparrows were concerned, instead of being horror struck as they should have been, they started in at once to pick the flower buds from the adjacent "Kentucky Wonders"—a thing they had never done before. I am not prepared to say that exasperation induced by the blue streamers impelled them to this unusual mischief, but the facts are as stated. Personally I intend to rely on hackneyed methods of dealing with sparrows in the future.

* * *

The most interesting profession in the world is made so, in part, by the contacts it affords with branches of natural science such as climatology, geology and zoology.

The weather, if its frequency as a subject of conversation is any criterion, is far from uninteresting, and to gardeners is most important. It is absolutely necessary that we should know a good deal about it, its effect on plants, the methods of foretelling frosts, etc. In our handling of soils we come in close contact with the science of geology, and in the zoological branch of natural science we are intimately concerned with furred and feathered friends and foes and also with that vast host of animals that has neither fur nor feathers—the insects. All of these subjects are intriguing to specialists and perhaps even more to gardeners, who for lack of time, can only approach them in a dilettante way.

With many gardeners to think of insects is to curse and not to bless, and yet many of the insects common in gardens have most entertaining life-histories, and some are of distinct service to the gardener. The beautiful "lace-winged flies" or "golden-eyed flies," which are fairly common about this time, are examples of insects which are beautiful, beneficial and interesting. The adults of one common species have transparent, blue, wonderfully veined wings and conspicuous golden eyes. The female lays its eggs on vegetation of some kind, each egg being supported about a quarter of an inch from the surface by a slender stalk. This probably protects them from other predaceous insects. I remember reading somewhere of a suggestion that the eggs were laid on stilts because the larvæ are so voracious that they would eat each other unless the eggs were elevated in this way. One would think this cannibalism could be prevented more effectually by laying the eggs at widely separated points. The larvæ feed largely on plant lice of various kinds which has obtained for them the name of "aphis lions." When they are full-grown the cocoons are spun in which they pupate to emerge later on through a circular lid in their exquisite adult forms. Although so beautiful one does not unnecessarily handle them more than once on account of the offensive odor which they emit.

Reasons for Fall Planting of Roses

S. C. HUBBARD

SPRING is undoubtedly the proper time for the growth of plants, but it is not always the best time for planting. In the more northern latitudes where there is practically no intermediate period the cold, wet Springs and the hot, dry Summers, Spring planting is very unsatisfactory.

Most rosarians have probably suffered a loss of plants to a greater or less extent in connection with their Spring planting and have accepted it as inevitable. This loss,

early in the season they frequently must be left in the package until the soil is in condition to receive them. With most nurserymen, the Fall is not as busy a time as the Spring, and consequently more time will be given in selecting the plants, and to the proper packing which in itself is an important factor of successful rose growing.

It may be well to state here that a good, strong, fibrous root system is worth more than any amount of top growth. The root system of the dormant field grown



No. 2



No. 1



No. 6



No. 3



No. 4



No. 5

however, may be reduced to a minimum by planting dormant roses in the Fall, preferably about the middle of October, or any time before the ground freezes.

There are several reasons for planting at this time. In the first place, by ordering in the Fall one is more apt to get stronger plants as they come directly from the field, while in the Spring, one often has to accept the left-overs which are always of poor quality. Even though ordered

plant is far superior to that of the pot grown rose which one has to use in late Spring planting.

On many soils in this latitude the earth is so cold and wet in the early Spring that it is impossible to plant until the middle or last of May and often not until the first of June. As a rule, it is impossible to procure dormant plants after the first of May. When they are obtained later than this, they are not very satisfactory, as they re-

quire a great deal of care and attention. With the best of care many of them will die.

In Fall planting the soil has a chance to become firmly settled around the roots and some slight root action takes place before cold weather. In other words, the plant has a better chance to establish itself before starting to do its work of producing flowers in the Spring. Unless planted very early in the season, Spring planting causes double work for a plant, since it is then necessary for it to make roots as well as produce blooms. Consequently a plant set out in the Fall, having its root system well established by the time the blooming season arrives, may direct all its energy towards producing flowers. This means flowers of better quality.

Another point in favor of Fall planting is the fact that as soon as growth starts in the Spring the plants may be fed with either manures or commercial fertilizers. With Spring planting, a month or six weeks must elapse before it is safe to force the growth by feeding. Since it is more advantageous to produce the growth during the Spring for summer flowering rather than in the Summer for later flowering, it will be seen that the fall planting is of decided benefit.

The two factors which cause the greatest loss in late Spring planting are the drying winds and hot sun. A great deal of careful attention is necessary to overcome this loss and to bring the plants safely through. They must be frequently sprayed with clear water and shaded every bright sunny day for at least two weeks. This may be entirely eliminated by Fall planting, for the wood is ripe and there is no action in the top or branches of the plant at this season. The accompanying illustrations will show more clearly than words the proof of the foregoing statements.

In figure No. 1 is shown the strong, fibrous, natural root system of a dormant field grown plant. This plant was not selected to show an especially fine root system, but rather one which is typical of this class of plant.

Figure No. 2 shows the roots of a pot grown plant. It must be understood that the term "pot grown" does not mean that the plant has been grown to its present size in a pot. No indeed. They are usually lifted from the field at one year old, and then potted in the late Fall or Winter. The top growth and flowers are forced during the Spring. Note the curled and cramped position of the heavier roots. This was caused by crowding them into too small a pot. (Of course small pots take up less room in the greenhouses than the larger ones, and are therefore cheaper to handle. These roots will retain their cramped and twisted form even after being planted for two or three years. In fact, this plant had been in the garden fourteen months. Naturally roots in this condition cannot absorb the same amount of nourishment from the soil as the roots in Figure No. 1. As No. 2 is the type of plant which must necessarily be used in planting after the middle of May or later, the illustration clearly shows why our choice is with the former.

(It is to be admitted that for late plantings where immediate effect is desired, the pot grown plants are the only choice).

No. 3 shows a plant of the beautiful climber Dr. Van Fleet which was planted in the Fall. Note growth it has made as compared to No. 4. This is another Dr. Van Fleet of the same age and size in the Fall when No. 3 was set out. No. 4 instead of being planted was potted, carried over Winter in a greenhouse, and put out in the Spring. The soil conditions and culture after planting were the same in both cases. Which is the better looking plant?

Numbers 5 and 6 show two plants of the H. T. Viscountess Folkstone, number 5 being planted in the Fall,

and number 6 planted the following Spring from a pot.

Undoubtedly some rose fanciers will not agree with the Fall planting, especially in the milder climate such as Philadelphia and vicinity. For such latitudes as permit early Spring planting, the writer does not advocate this plan, since he has had no experience in the milder parts of the country. However, in the colder parts of the country where the soils are heavy and Springs late and wet, he is convinced after ten years' work that Fall planting will give the best results.

THOSE WHO WORK IN GARDENS

M. O. B. Wilkinson

HOW strong they become who work in gardens for the sheer love of it!

They are always learning, loving, seeking to understand and to utilize.

They foster the beloved weak and fight the inimical strong.

They root out the fulness which is a fault and fill the emptiness that cries for more.

They are able to beget and breed beauty.

Those who work in gardens plant other things than seeds and bulbs, tubers and cuttings. They plant hope and faith and love.

They gather in more than crisp vegetables, lucent fruits, and flushed flowers, for they gather hardihood and health and a rich fulfillment.

Having planted according to the law, they expect germination according to the law, and the flower and the perfect fruit. They do not worry lest what ought to be will not be. They have the confidence of seers, wherefore they are seldom disappointed.

Those who work in gardens work in the laboratory of life. They know as much as any one of its coming and its going; and far more do they know, than most of us, of its growing and striving, fighting, winning, blossoming, becoming and being. They see many meanings unintelligible to others.

God has given into their hands a book of secrets.

As they press the earth with kindly hands they smile inscrutably, and the earth yields up her smiling strength as their reward.

In a garden there is as much chance for self-expression as in any art, if only the soul of the gardener be free of a money bond.

For a garden may be compact enough to reveal the careful soul, whimsical enough to show the dreamer, stately for the proud, homelike for the hearth-lover, fragrant for the serenely religious. The variety is endless. The combinations can not be counted.

But always, those who work in gardens, make them, in something, like themselves.

And there is in a garden as great a chance for altruism as in any philanthropy.

The sick of soul will lag beside a sloping lawn, or under the generous, shade-bestowing tree. The weary of heart can find a bit of peace in benevolent arbors, or in bowers of friendly shrubbery. The poor can forget their debts for a space while they watch bewitching poppies nodding to each other. And are there not a few convicts who would be gentler with their arms full of roses?

How natural it is that those who work in gardens should be strong. They are very close to the heart of life. Perhaps, also, they are close to God!

Hardy Spireas

ARBORUM AMATOR

OF all of the hardy ornamental flowering shrubs none give greater general satisfaction than the Spireas. They are of easy culture, very floriferous, and their foliage as well as their flowers is pretty. Furthermore, if we make a careful selection of species, one or more of these will be in bloom each month from April to November. Indeed one or two species bloom periodically throughout the Summer and Autumn under proper culture. Again they are adapted to many uses in both small and large landscape work. Lastly their comparative immunity from disease and insects commends them strongly to our favor.

Spireas belong to the botanical order *Rosaceæ*, of which the Rose, Hawthorn, Plum, Blackberry and Apple are also members. They are natives of Asia, Europe and America. Some species are hardy; others, half-hardy, and still others tender perennials. We will mention some of the most desirable hardy species.

Classification According to Flowering Period.—Spireas may be divided as regards their flowering period into two classes, namely, the *Chamedryon* group, the members of which produce umbels of white flowers from April to June, and the *Calospira* and *Spiraria* groups, whose panicles or corymbs of flowers, some white, others pink, and still others crimson, continue to appear more or less from June till mid-Autumn. The species and varieties of the first group, though their flowering period is comparatively short, make for the time a wonderfully beautiful and showy display, which well repays for the year's care of these. The members of the second group have a much longer blooming period and some bloom repeatedly under careful culture.

FOREIGN SPECIES THE TALLER GROWERS—*Spiraea prunifolia flore pleno*, though a native of China, was brought by Dr. Siebold from Japan to Europe and thence into the United States. Of all the Spring-blooming Spireas this is easily one of the most valuable. In form it is bushy and it attains a height of five to ten feet. In May its pretty, white, double flowers are produced in great numbers, the entire height of its slender, graceful branches. The foliage, too, of this species puts on a beautiful orange color in Autumn. This Spirea has been highly recommended for seaside planting, as it appears to be benefited by proximity to the salt water.

Spiraea Thunbergii, a native of Japan, grows from three to six feet high; thrives in almost any location and is very hardy. When it is closely covered in Spring with white blooms, it presents a marvelously beautiful sight. The pretty bronze and golden tints which its foliage assumes in Autumn gives this Spirea an increased value. When selecting shrubs for planting, we too often fail to give preference in our choice to those which carry well into the Autumn a foliage which puts on pleasing shades of color as well as produce pretty flowers in Summer.

Spiraea Van Houttei has a spreading form and grows from four to six feet high. Though of comparatively late introduction from Japan, a country from which we have received many of our best shrubs, it has justly achieved great popularity. In May its white flowers appear in great profusion.

Spiraea Reccesiana is considered by many the most beautiful of the genus *Spiraea*. It is hardy south of New York, but farther north requires some Winter protection. This species comes from China. Its large blooms of purest white appear in June.

The Dwarfier Species.—There are several Spireas of low growth. *Spiraea cana* attains a height of no more than two feet, and forms a rounded bush as broad as it is high. This Spirea is a native of the Croatian Alps, growing there in dry, bare, rocky locations. For this reason it is very suitable for planting in rockeries, and is much used in England for that purpose. It is extremely floriferous, carrying its small white flowers along its stem as well as its branches. Furthermore its small leaves, grayish and indeed sometimes almost white, at once draw attention to this charming little shrub.

Spiraea decumbens is the dwarfest of all Spireas. It has a procumbent form and grows only about six inches high. In June its white flowers appear. This Spirea is admirable for planting in rockeries.

Spireas have small alternate leaves, usually simple, but in a few cases pinnate. *Spiraea trilobata* is an exception; this species has three lobed leaves. A native of the Alsatian Alps, it reaches a height of only two feet. In May it is well covered with corymbs of small white flowers.

Another small Spirea, but a little taller than *trilobata* is *Spiraea arguta*, a relative of *Spiraea Thunbergii*, and like it coming from Japan. This Spirea has slender branches, which are covered in May with an abundance of pearl-white flowers. This species thrives well in the South and West, and is also hardy in the North.

Later Flowering Species.—The Spireas which we have mentioned thus far all bear white flowers and bloom only once in a season and in the Spring months.

Spiraea Bumalda not only in its entire make-up is a handsome shrub, but is all the more valuable because it bears beautiful pink flowers which begin to appear in mid-Summer and continue to appear until late Autumn, when few shrubs are in bloom. This Spirea is a vigorous grower, yet reaches a height of only two to three feet. It is an excellent border shrub and can be used in beds instead of such tender plants as Salvias and Geraniums, having the advantage of permanency.

Spiraea Anthony Waterer, said to be a variety of *Bumalda*, came to us from England. Its bright crimson flowers, in larger heads than those of *Bumalda*, appear in June, and if the withered flowers are removed, others follow until late Autumn. Attaining a height of two to three feet only, this Spirea is excellent for making a low hedge and for groups and beds.

Spiraea Lindleyana is a native of the Himalayas. The pinnate leaves of this species make it distinct from most others. Its value is enhanced by the fact that its white flowers are produced in September. Even when planted so far North that it is killed to the ground in Winter, flowers will be produced next season on the strong Spring growth.

Spiraea Callosa and its variety *alba*, the former bearing pink and the latter white flowers, were introduced into this country from China by Mr. Fortune, and the variety *alba* is sometimes called "Fortune's Dwarf." These Spireas are useful for outlining paths and for low ornamental hedges. *Alba* remains in bloom for a considerable period of time.

Native Species. There are several native Spireas, which, though worthy of cultivation, are inferior to the foreign sorts. Among these are *Spiraea tomentosa*, commonly called Steeple Bush because of the shape of its

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THE HONEY HARVEST

H. W. SANDERS

THE Fall of the year is the great harvest time for everything that depends upon the progress of the season for its maturing, and the beekeeper as well as the farmer, the gardener, and the fruit-grower, looks forward to the pleasant task of garnering the fruits of his labors. Perhaps one ought to say, "the labors of his bees," for the little insects have worked throughout the Summer with their wonted and untiring energy in storing the honey that we propose to take from them, but in the last analysis, it is the skill and knowledge of man that has produced the crop, for without the modern hives and appliances that man has invented, the energies of the bees would have been consumed in multiplying their numbers by way of the swarm, and the honey stored would have been but barely enough to feed them till the next season.

In taking off the harvest, the beekeeper is urged to be generous to his little servants in the matter of their Winter supplies. Great numbers of colonies of bees are lost every Winter and Spring, simply through starvation, and this is a double loss, since both bees and feed are gone. It is far better to leave them an abundance of feed, or else take all that they have for sale or use, and join them to the neighboring colony, leaving the united colony thus formed with an abundance. Generally it is concluded that from twenty-five to thirty pounds of honey is needed for wintering a colony of bees, but the amount varies, and the safest way is to leave them as much as their hive will contain. We go through the hives early in September and see that every comb not actually occupied with brood, shall be well filled with honey. If not it is exchanged for such an one. Then there will be a certain amount in the top corners of the brood combs, and between the two sources we feel that they have plenty. When thus provisioned, a hive should be about as much as a man can comfortably lift, and when this is the case, the stores may be considered to be ample.

Having provided the bees with their Winter food, we may now proceed to take our crop of honey. The amount of it will vary between the limits of extreme scarcity and great plenty, according to the season, the beekeeper, the strain or breed of bees, and the management. We have known of as much as 400 pounds having been yielded by a single hive, and yields of from 100 to 150 pounds are not uncommon. Perhaps about sixty pounds might be considered an average taking one season with another, but there exist the most striking divergences between the seasons, and the colonies.

This honey is stored in the "supers" that we have given to the bees from time to time, as they have occupied the ones previously given, and it is according to the kind of supers given that they have stored the crop in the form of "comb honey" or of "extracted honey." If we have provided the small sections holding about a pound of comb honey, then our harvesting will consist merely of getting the bees off the combs and the honey is immediately ready for use. To accomplish this the bee-escape is used. This is a small device in which there are two slender springs so adjusted that bees can pass through them one way only, and the escape being fastened in a board, the super can be thus cut off from the rest of the hive. If the boards are gently slid between hive and super at night, by morning the honey is often free of bees. Sometimes it takes 24 hours, but the device usually works all right and then the supers can be

taken into the house and the honey removed, scraped and sold, or stored for subsequent use. It should be stored always in a warm, dry, place.

If the supers given were filled with the same large combs that are used below in the brood-nest, then these must be extracted in the machine designed for that purpose. This form of honey production is so much simpler that it has become well-nigh universal, the production of comb-honey being now confined to the hands of the specialist. The combs can be taken out of the hive on any sunny day, using a little smoke to quiet the bees, and being careful to prevent robber-bees from getting access to the honey. The bees are now brushed off the combs with a small brush or a bunch of grass in front of the hive and the combs, as they are freed of bees, are taken to the honey-house. Here they are uncapped with the knife designed for that purpose, the cappings dropping into a tank where they can drain off their honey. Afterwards they will be melted up for beeswax. The combs thus uncapped are placed in the baskets of the extractor and revolved rapidly. This has the effect of throwing the honey out of them by centrifugal force against the sides of the can, and there is no more pleasant sound than this, that resembles the beating of rain against a tin roof, and tells the beekeeper of an abundant yield. The honey collects in the bottom of the extractor and can be drawn off through a faucet into cans or bottles and sold. It is well to let it settle in the extractor or another tank for a day or so, so that any bits of wax that may have got in will float to the top and not get mixed with the honey.

The combs when extracted are piled up where the bees cannot get at them, and allowed to remain till night. Then they are taken and replaced on the hives, and soon the bees will have cleaned and repaired them, and they can be stored away till next season. This is one of the advantages of extracted honey, that the combs can be used season after season, while the comb-honey producer has to provide his bees with new supers and foundation in each successive season.

"IT COULDN'T BE DONE"

Somebody said it could'n't be done,

But he with a chuckle replied

That maybe it couldn't, but he would be one

Who wouldn't say so till he tried.

So he buckled right in, with a trace of a grin

On his face. If he worried, he hid it.

He started to sing as he tackled the thing

That couldn't be done, and he did it.

Somebody scoffed "Oh, you'll never do that;

At least no one has ever done it."

But he took off his coat and he took off his hat,

And the first thing we knew, he'd begun it;

With a lift of his chin, and a bit of a grin,

Without any doubting or quit it.

He started to sing as he tackled the thing

That couldn't be done, and he did it.

There are thousands to tell you it cannot be done;

There are thousands to prophesy failure;

There are thousands to point out to you, one by one,

The dangers that wait to assail you;

But just buckle in with a bit of a grin,

Then take off your coat and go to it;

Just start in to sing as you tackle the thing

That cannot be done, and you'll do it.

Edgar A. Guest.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

WITH the advent of September the beginner in gardening naturally thinks his garden is on the home run as it were, but as a matter of fact this is the time when the most profitable work can be done. Relieve the Spring rush by doing whatever can be done this Fall! One has more time to think it over and can make a more permanent job of it.

Among the first things to be planted are the pæonies. This beautiful hardy perennial is becoming more popular as the years go by, and rightly so, for they are to be had in a wide range of colors that will suit all tastes, are not in the least exacting, and increase rapidly. Iris, of course, we have an even wider range of color, and greater variety of type, and season, etc.

Other perennials will soon be available for planting, and with but few exceptions they all can be handled in the Fall. Prepare to replenish the perennial border where plants are lacking, and if you do not have such a border now is a good time to start one.

In doing so it is well to bear in mind that you are making a feature of the garden that is to be permanent, and it is more economical in the end to do it right. Spade the ground at least 18 inches deep, and add plenty of well decayed manure, and after this is dug in, rake in a liberal sprinkling of bone meal.

Then there are the bulbs to plant. Of course, you have ordered them long ago. No garden can afford to be without these harbingers of Spring. Whole beds may be given over to one or more varieties, or small groups of several varieties may be planted throughout the flower border. However, one of the most effective uses bulbs can be put to is naturalization planting. Only such bulbs as keep increasing from year to year should be used, and they are planted in locations where they remain undisturbed for years. Wild gardens, woodlands that are not too dense, borders of shrubberies, etc., offer opportunities for the permanent planting of bulbs. Unquestionably the Narcissus family offer the best bulbs for this purpose. It is really astonishing how readily bulbs increase under favorable conditions. Practically all the more common types of narcissus are available. The beautiful native *Trillium* is invaluable for woodland planting, its frail, delicate appearance in early Spring always exciting admiration.

In some places the old Tiger lily can be used and will increase rapidly, and several of the Japanese species of lily like *L. regale* are quite amenable to naturalization. The alliums are best adapted for wild effects, for being of the onion class, they have the characteristic odor of that family, yet they make an effective mass when established.

In the flower garden the roses should be showing up well. Roses that have been well fed will be giving a supply of flowers equally if not exceeding in quality those of June. All tall flowers such as Cosmos, Dahlias, etc., should be kept tied to stakes, for boisterous weather may be expected any time and they are easily broken. Anemones will be benefited considerably by an application of plant food just as soon as the buds show.

Cutting of such bedding plants as it is intended to winter over should be taken at once if not already done. Taking cuttings should not in any way mar the appearance of the beds, because the necessary pieces can be taken

at intervals, and should leave no holes or bad spots behind Geraniums, Coleus, Verbenas, Heliotrope, and other tender bedding plants can all be profitably raised from cuttings.

Remove all the dead plants from the flower beds and endeavor to maintain a neat, clean appearance throughout the garden. Don't get careless because the end of the season is drawing nigh. Get the last possible day of pleasure out of it.

Hedges that have not had their last clipping should be attended to at once. Late growth from late clipping makes the whole plant tender and susceptible to Winter injury during severe Winters like we experienced last year. Get busy on the plans for the planting of deciduous trees and shrubs. Don't wait until the season is right on top of you. It is not necessary, either, to wait until all the leaves have dropped. As soon as the leaves turn color the wood is ripe and the plants may be moved. Get the storage place ready for such ornamental plants as Hydrangeas, Bay trees, Oleanders, etc., for you cannot tell how soon you may need to use them.

When cleaning up the gardens don't make the mistake of burning up the leaves in order to have the place look tidy. They contain a vast amount of plant food, and who dare estimate the amount of plant food that is consumed by fire every year by burning up the leaves. Leaves when rotted make the finest of fertilizers, and for opening up heavy soils have no superior. Store them in a pile in an out of the way corner, and turn them over once in a while, and you will be surprised how soon you will have collected a compost heap of no small value.

In the greenhouse tomatoes should be sown for forcing, if not already done. Carter's Sunrise is a good forcer, and though not large is of all round excellence. Red Currant and red and yellow cherry also force well and are very useful for garnishing purposes.

Early flowering sweet peas should have been sown last month, but it is not too late if started at once. Beans should be sown inside the latter parts of the month, and successional sowing made every three weeks or so. Cucumbers may also be planted at this time, and they make fine companion plants for the tomatoes. Select a position at the warm end of the house, and box in the pipes under the bench so as to throw the bottom heat to the cucumbers. Annuals may be sown to supplement the supply of cut flowers through the Winter months, and with the exception of mignonette, which is not a cropper, may be sown at varied intervals, to maintain a regular supply. *Schizanthus*, *Gypsophila*, *Nicotiana*, Stocks, Annual Lupines, and Annual Larkspurs comprise a list of good forcers.

Carnation plants that were benched early are now showing signs of active growth, and every effort should be made to keep them growing right along without a check. Rust is apt to get started on the plants at this season if one is not careful. Keep plenty of air on at night, and don't overwater. Remember that the benches are by no means filled with roots yet, and too much water would spell disaster. When syringing to dislodge red spider be sure that the plants are dried off before night, for we believe that nothing is more conducive to rust than having the plants wet overnight. Should you get caught with the plants wet on a dull day go over every plant and

shake the water off. Spraying with home mixed Bordeaux is good practice, and prevention is better than cure. Aphis should be kept under control with Nicotine sprays, and in this connection it might be well to point out that if common table salt is added to the nicotine spray it will go far to help check red spider. Not more than two ounces of salt should be used to a gallon of water. One has only to walk into a carnation house early in the morning after the plants have been sprayed with a salt and nicotine solution and run one's fingers through the plants to understand how it is that salt helps check red spider.

There is a damp humid feeling about the plants that seems to suit them but which red spider doesn't appreciate.

The growing crops will need some attention. Keep after the cabbage worm on the late cabbage. It may be dangerous to the consumers to use a poison spray at this time so the next best thing to do is to pick off the caterpillars. This is not such a hard task as it may seem. Better feed the cabbage to the chickens than leave them to the mercy of these caterpillars. Potatoes should be dug at any time now choosing the cool, clear weather, as they should be perfectly dry when stored, and don't forget to sow the ground down with rye and crimson clover just as soon as the potatoes are all off. Should crimson clover not do in your locality, sweet clover is worth trying, though only in its infancy as a cover crop.

Roots of celery may be lifted from the open ground and transplanted to frames for a Winter supply. Celery will need attention in the way of blanching.

Special blanching papers are now on the market, or boards may be used, or one may resort to the old time method of simply earthing it up and blanching it. All diseased leaves should be picked off and the plants sprayed with Bordeaux mixture before blight puts in an appearance. Prevention is better than cure, so take time by the forelock and spray early.

It is not too late to make new lawns and renovate old ones with every assurance of success if done as early in the month as possible. Watering newly sown lawns is not good practice. Far better it is to leave them alone until a good rain occurs, for in order to succeed properly the new seeding must have all the conditions that accompany rain, such as darkness and dull moisture laden atmosphere.

We have made passing mention of the adaptability of bulbs for outdoor culture, but one of their greatest assets is the readiness with which they lend themselves to indoor culture, either in the greenhouse or dwelling. There are two distinct methods under which they can be grown with every assurance of success, either in pots and pans with ordinary garden earth, or in standard bulb glass with water only. The latter method, however, destroys the bulbs for further use as the leaves and flowers use up practically the whole of the old bulbs during their development. In the case of culture in pots or pans with earth the roots emitted are able to secure some nutriment from the soil which allows the bulbs to hold their own and after forcing may be planted permanently where they will flower more or less in subsequent years, though they are not to be used for forcing two years in succession.

For forcing in the house plant the bulbs as soon as you can secure them, they may then be placed in a cool cellar after being thoroughly watered, but preferably they should be placed outdoors and covered with ashes or other refuse until they are rooted through which will take from five to six weeks. As soon as a mass of roots show in the bottom of the pots they may be brought into the house for forcing, as one wishes to have them.

Essentially there is but little difference in the water culture method. Small glasses holding a single bulb

may be used, or large bowls may be used holding several bulbs. In the bottom of the bowls place some small clean white pebbles and a little broken charcoal to keep the water sweet. The roots that will develop will cling to the pebbles and give them support enough to keep them upright. The glass and bowls need to be put away in a cool, dark closet or cellar until they have emitted a mass of roots. It is not necessary to change the water, but keep it filled up to a point level with the bottom of the bulbs.

While all of the Hyacinths may be forced in this manner yet the Dutch Hyacinth is the one most commonly used. Of the Narcissus family the ever popular paper-white *N. Grandiflora*, is the best, though any of the double or single Jonquil or *Polyanthus* types may be used. Tulips are easy to force, but only the extra early forcing varieties should be selected for the house. May flowering or Darwin tulips may also be forced in the house, but not to bloom early. It is not safe to start this class of tulips before the middle of February.

HARDY SPIREAS.

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spirals of showy, rose-colored flowers which appear in July and August. This Spirea is of unique appearance on account of its brown stems thickly furnished with leaves, green above but whitish beneath. This Spirea is widely distributed over the United States. It makes a very pretty Summer hedge or division line.

Spiraea regeliana grows from three to five feet high. Dense panicles of rosy pink flowers are produced in July and furthermore upon its new growth a second crop of flowers usually appears in Autumn.

Spiraea salicifolia, and its varieties *latifolia* and *alba*, often called Meadow Sweet, are found in this country growing in the edge of swamps or moist meadows. This species produces terminal panicles of flowers rosy-white or white in July and August.

From the Pacific Coast we have *Spiraea arifolia*. This is a good shrub for shady places. In July it bears panicles of small white flowers with a yellowish green tint. In its Pacific habitat it reaches a height of eight feet, but in the North it is of much lower growth and is benefited by some Winter protection.

The list of Spireas which we have mentioned is by no means exhaustive but it comprises most of the best for general culture.

Pruning. The species which belong to the early flowering group should be pruned very little; only the weak shoots should be removed and the stronger shoots after they have finished blooming thinned out sparingly. The late flowering group should be pruned severely as soon as their first flowering is over.

Soil and Location. Spireas flourish in a moderately fertile soil and prefer a moist but not wet location.

Propagation. The only flowering Spireas are propagated from greenwood cuttings taken during the Summer and placed in sand under glass. The later flowering species are increased from hard wood cuttings taken off in Autumn or Winter and placed upright in boxes of sand in a cool cellar. Greenwood cuttings should be planted out in the garden as soon as rooted, and hard wood cuttings the next Spring.

"Just one remedy will cure every ill in our distracted world today, and that is Christianity. Its practice must be by every individual in all the relations of life—in statecraft, in business, in social relations, in the home, in the secret life and thought. For this transformation we need a new brand of discipleship—the discipleship of the single eye."

Up-To-Date Pruning Practices

RECENT experiments have thrown much light on pruning, and recommendations are somewhat of a modification of those put forth a few years ago. Time was when a heavy annual heading back was highly recommended, but recent results have shown us our error, and now rigorous heading back is only to be recommended with reservations attached.

At planting time the young tree receives its first pruning, which consists in the removal of broken branches, the elimination of cross shoots, the selection of the best placed four or five branches to form the main part of the tree, and the heading back of all remaining growths by about one-half. Before this first pruning can be intelligently performed the grower should decide, first, the height of head he desires; and second, the type of tree he wishes to grow.

Types of Trees.—The different types of trees that one may grow may be roughly divided into three classes. One is the pyramidal form, another is the open center, and the one that is recommended for most conditions is a combination of the two. The first, or pyramidal form, which consists of a central leader with branches radiating from it, gives too large and too high a tree for our conditions. It shuts out too much sunlight, thus making the production of clean, well-colored fruit a more difficult task than it should be. The first factor to consider, therefore, in choosing the type of tree is balance between sanitation and strength of tree. The central leader type cannot be called a sanitary type of tree. The open center tree, while possessing admirable sanitary qualities, does not possess the strength of the central leader type, so that a combination of the two is more desirable. This combination type consists in allowing the central leader to grow for the first few years until five or six good branches, arranged in a whorl, and well spaced, can be selected to form the framework of the tree. By well spacing these scaffold limbs the tree is stronger than if all the limbs arise from a small area where they would each be pulling against the other, and would break down under heavy winds or heavy loads of fruit. The central leader is not allowed to grow to any great height, so that you have a type with the combined advantage of the pyramidal form and the open center, and with their objections eliminated.

The Pruning Year by Year.—Having decided on the form our tree shall take we are now ready to follow the pruning year by year. The first year, or the year the tree is set out, it will be necessary to head back all branches in order to give the roots an opportunity to get a hold and to make our trees stocky instead of long and willowy. In recent experiments conducted by the experimental station at Kentville, N. S., trees cut back when planted made a growth of 4.82 inches the first year and 20 inches the second, while trees not headed at all made a growth of 1 inch the first year and only 2.4 inches the second year. Commencing with the second year, the practice to be adopted will depend upon, first, the variety; and second, the vigor of the tree. Some varieties are straggling and vigorous growers, others are as vigorous but more shapely in their habit, while others are slow growers. All can stand slightly different treatment. An example of the first type of tree is the King. The second type is represented by the Baldwin, while the Wagener is a typical example of a slow grower. Each of these three types will require individual treatment. The King can be made into a shapely tree by somewhat vigorous pruning, whereas for the Baldwin a moderate amount of shaping

up will suffice, while the Wagener type may have to be headed in occasionally in order to obtain sufficient annual growth to make a shapely tree.

About Heading Back.—A tree which is vigorously headed back in Spring will probably produce a greater length of wood that season than one which is not so headed back, but the girth measurement of the tree not headed back will be greater, so that, after the first year, to cut back annually with the idea of obtaining stockiness is a mistake. This "butchering" should only be resorted to to allow of the development of a vigorous and shapely tree. In general, then, the practice to adhere to during the younger stages of a tree is to give it as little pruning as will maintain a well-formed, vigorous tree. It has been shown by experiment that trees cut back annually do not fruit so early as those which receive very little pruning, neither do they fruit so heavily.

Points to Remember.—In cutting back a main branch, and one of its strong-growing laterals, do not cut both to the same length. Permit the main branch to retain the lead, otherwise two branches of equal dimensions will result which will produce a very weak crotch, a constant source of trouble. Whenever given the option of selecting either a branch growing at a sharp angle to its parent or one growing almost at right angles, choose the latter; it will make a stronger crotch in future years. Always cut back to a bud, cutting as close as possible without injuring the bud itself. By paying attention to the position of the bud one can do much to decide the form the tree shall take. Study each variety you are dealing with, and adopt a system most suited to its needs.

It is not a question of how much pruning one can do, but how little one can do and still retain the desired shape, vigor and productiveness of the tree.—*Canadian Horticulturist*.

If nature wants an oak, she works on the job a hundred years, if she wants a squash, six months is sufficient.—*Charles W. Eliot*.

* * *

Blessed is he who has found his work; let him ask no other blessedness. He has a work, a life purpose; he has found it and will follow it! Labor is life; from the inmost heart of the worker rises his God-given force, the sacred celestial life-essence breathed into him by Almighty God; from his inmost heart it awakens him to all nobleness—to all knowledge, "self-knowledge," and much else, so soon as work fitly begins.—*Carlyle*.

* * *

Almost as deplorable as the other extreme of self-conceit is self-disparagement, and more surely derogatory and hampering it is to personal success. Never, neither openly nor secretly, derogate your own powers or abilities. Learn, on the contrary, to think well of yourself, to believe in your own latent capacities, and to respect your individual, God-given rights and titles to success and happiness in life and all the good things which these two terms suggest. Thus only can you become as a magnet toward the things you desire; thus only will you cease to be dull and inefficient in your efforts and become capable—able to achieve and accomplish the cherished desires of your heart. Be kind to yourself—cultivate confidence in your own ability to win. If you have no confidence in yourself, how in the world can you reasonably expect others to have?—*O. Byron Copper*.

A Lesson on The Production of Available Plant Food in the Soil

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

During recent years scientific investigators along the lines of crop production have made soils a prominent feature of their work, and rightly so, since the soil wealth in connection with plant growth is the greatest and the most important form of the wealth of a nation.

Our knowledge regarding the chemistry, physics, geology and bacteriology of soils is still far from complete, but a great many fundamental principles of soil fertility are, however, well established, and the cultivator today has far wider possibilities of intelligently increasing and conserving the fertility of soils than was the case in the days of Pliny, who wrote some 2,000 years ago. "The Earth, gentle and indulgent, ever subservient to the wants of man, spreads his walks with flowers and his table with plenty; returns with interest every good committed to her care, though constantly teased more and more to furnish the luxuries and the necessities of man."

There is no exact science of the soil, and it lies on the borderland where the chemist, botanist and bacteriologist meet the gardener and the farmer. We propose this month to discuss briefly one phase only of the relationship between the soil and the plant, and to set forth some of the results of investigations which have been made by scientists in the above respective branches of science.

By long custom gardeners and farmers give the name "plant food" to those substances in the soil which help the plant to grow, and while the term could be criticized from the standpoint of plant physiology, physiologists have never supplied a term equally as expressive and as simple. At the same time most of us are aware that what are called plant foods are strictly speaking only the raw material out of which—if such material is in an available condition—the plant forms its food by processes infinitely wonderful and complex. Plant food in the soil we shall understand to be those substances—available or unavailable, as the case may be—which a plant requires, and in speaking of the production of available plant food in the soil we refer to the changing inorganic and organic plant materials naturally in the soil in a condition of availability.

The processes of soil formation have been previously briefly set forth in these lessons and we cannot at this time afford space to repeat them. In connection with our present subject, however, it may be mentioned that a soil is, roughly speaking, composed of two parts:

- (1) Substances which were part of the original minerals from which it was derived.
- (2) Substances which have come in as the results of vegetation.

Earth composed entirely of mineral matter is not soil, the formation of the latter is not complete until vegetation has sprung up and died and its remains have mingled with the mineral fragments and have begun to decay. Further, soils contain a large population comprising various species of bacteria and other micro-organisms which are necessary to the growth of higher plant life, these organisms not being found in merely pulverized rock. It is generally known that the earliest form of vegetation upon the hard rock is those minute plants called Lichens, but how this soil population springs up in the first place we do not know, but we do know that the production of available plant food in the soil is, in the case of one at least of the plant's necessities, entirely dependent upon it (excepting so far as we may apply plant food to it in an available state, such as nitrogen in the form of nitrate), and indirectly to a greater or less degree in the case of most of the plant's other food requirements also.

While soils vary in their richness, potential or otherwise; in their physical characters, whether light or heavy, and in their depth; we can, for all practical purposes, assume that all soils are capable of supporting vegetation—otherwise they are not soils at all—except in the case of vegetation being impossible on account of an arid climate—and that they contain more or less of all the ten or twelve ingredients necessary for plant growth. As regards depth, ordinary tillage rarely goes below eight inches, although it might in many instances go deeper with advantage.

An acre of land eight inches deep, calculated on an air-dry basis, weighs upon the average one thousand tons. Most people

would consider an application of half a ton of complete fertilizer, or its equivalent in stable manure (not forgetting that stable manure is seventy-five per cent water) an ample dressing each year, although in truck farming and in gardens double this quantity is generally used. Based upon the above weight of an acre of soil an application of one ton of fertilizer gives only two pounds to a ton of soil. Probably few of us have realized what an insignificant and infinitesimal proportion this really is, as, at the rate of a ton of moisture-free fertilizer to the acre we do not supply more than one grain to each pound of soil. It would scarcely appear possible that such a minute quantity, only one part in seven thousand, could have any effect upon a crop, and yet we know that it does have effect. Further in this connection, we must remember that with one ton of high grade complete fertilizer we only apply about five hundred pounds of actual plant food in the forms of nitrogen, phosphoric and potash, which may or may not be all available. From this we have forced upon us the important part which the natural plant food in the soil must play in crop production.

It has long been known that practically all tillable soils are naturally rich in all plant food elements. The average of the results of forty-nine analyses made a few years ago of the typical soils of the United States showed per acre for the first eight inches of surface, 2,600 pounds of nitrogen, 4,800 pounds of phosphoric acid, and 13,400 pounds of potash. If all of this potential fertility were rendered available, there is present in such an average soil, in the first eight inches, enough nitrogen to last the average crops for 100 years (without taking into consideration nitrogen brought into the soil from the atmosphere by clovers and other legumes), enough phosphoric acid for 500 years, and enough potash for 1,000 years. In addition to this there is the unestimated plant food in the earth below the depth of eight inches.

Most people will at once ask, "Why, in the face of all this plant food in the soil is it necessary to fertilize at all?"

In the first place we must remember that only a very little of the natural plant food in the soil is in a condition available for the plant. Further, in spite of all the scientific research which has been going on for many years and the wonderful advancement in our knowledge of the relationships between the growing plant and its environments, the above question even today cannot be fully answered. We know that manuring generally increases crops, and we know that, especially in fertilizers of an organic nature, some of their benefits are outside and beyond those derived from their actual plant food content; but we also know that there is a great deal which in the present state of our knowledge is unexplainable. At the same time, while giving manuring all the credit it is entitled to, we can by devoting more attention to the rendering of the plant food naturally in the soil available, greatly reduce the cost of crop production without decreasing the crops, by reducing the expenditure for expensive fertilizers.

It must be borne in mind that a chemical analysis of a soil is no criterion upon which to base an opinion as to its fertility at the time the analysis is made, because soil analyses do not distinguish between what is available and what is unavailable. While there is naturally a difference in the quantities of the various plant constituents soils contain we may for all practical purposes assume that those constituents are present in all tillable soils. A dozen different elements are required by plants as food, but the only ones necessary to trouble about are nitrogen, phosphorus and potash; lime is only required as actual food in a very small degree, but it has a greater importance in other directions which will be alluded to later on.

While every ingredient is important in the sense that plants must have all of them or suffer in their growth, nitrogen generally has the first place on account of its expensiveness when purchased in fertilizers; its tendency to be easily lost from the soil, and to the fact that it only exists in the soil as the result of vegetation, that is to say, that merely pulverized mineral matter practically never contains nitrogen.

In a pure and uncombined condition nitrogen forms a large proportion of the atmosphere, but in this state nitrogen is unavailable as plant food. To become available it has to undergo in the soil the process known as nitrification. The work of

nitrification is carried on by the ceaseless activities of several species of micro-organisms classed as bacteria, and recent investigations at New Jersey and Rothamsted seem to suggest that in addition to bacteria, minute plants classed as ferments, molds, etc., also assist in the process of nitrification.

The fascinating story of the nitrifying organisms is now becoming an old one and we have previously in these lessons briefly outlined their work, but the story bears retelling, especially for the benefit of the many new readers of this journal.

The nitrogen found in the soil is derived chiefly from the accumulated remains of animals and plants, but *as nitrogen*, it is useless to be used again as plant food. Not until the nitrogen has been changed into a nitrate does it become available. This change can only take place by the work of micro-organisms, and the passage of soil nitrogen into a nitrate involves several stages each complete in itself, and each stage is the work of a distinct species of bacteria.

Roughly speaking, nitrogen is first broken up into ammonia, a process involving several changes. If the ammonia were left to itself it would be partly lost into the atmosphere and partly changed into carbonate of ammonia, a substance of which the plant may possibly utilize indirectly small quantities, but which in excess is harmful to plant life. But the ammonia is not left to itself. It is at once seized upon by another set of bacteria—quite distinct from those bringing about the existence of the ammonia—which change it to nitrite; this in turn is acted upon by another micro-organism, also quite distinct from any other, and changed to nitrate. Strictly speaking the bacteria do not actually form the nitrate, but they form nitric acid, which acid immediately combines with and is neutralized by some base, provided such base be present, generally lime as being the most active of bases, although it may combine with soda or potash, and the result is a nitrate of one of these bases; such nitrates, being soluble in water, are therefore easily available for the plant.

All living organisms, if they are to live and carry on their work, must have their proper food requirements and live under a suitable environment, and in these requirements the nitrifying organisms are no exception to the rule.

Two conditions which are highly detrimental to these nitrifying organisms are acidity of the soil and the lack of air. They also require food, which they obtain from phosphates and other minerals already in the soil. While they cannot carry on their work in acid soils, neither can they do so in those of extreme alkalinity. Also, as is implied by a previous statement, nitrates cannot be formed without the presence of some basic material. Another requirement is an adequate supply of oxygen. This is obtained from the air in the soil. When soils are saturated with water or in a condition known as water-logged, nitrification cannot go on for want of oxygen. The formation of a hard, dry crust on the surface of soils also checks nitrification. In a very dry period the process is arrested for want of water. Temperature is also a factor, the most favorable being from 50 to 90° F. The presence of organic matter in the soil is also necessary and when thoroughly decomposed nitrifying bacteria obtain part of their food from it, but the presence of much partly or undecomposed vegetable or animal matter, otherwise known as organic, materially checks the work of these organisms.

In order to allow nitrification to proceed all the necessary conditions must exist, and the process is frequently checked or stopped entirely either because one or more of these conditions are unfulfilled, or because of the existence of conditions which are distinctly adverse to the life of the bacteria.

Excepting temperature out of doors, the cultivator has the creating of the necessary conditions for nitrification practically under his control. He can by cultivation cause his soil to be well aerated so as to supply plenty of oxygen, which cultivation also tends to keep the soil moist; he can correct acidity by liming, which at the same time supplies a base for the nitric acid to combine with; organic matter can be supplied by the turning under of cover crops and the phosphates can be obtained from those already in the soil. It will therefore be apparent that along these lines available nitrogen can be supplied to the soil at a merely nominal cost.

Thus far we have considered nitrogen from the point of view of rendering available the organic nitrogen contained in the soil, but there are two other processes, which as they involve the use of atmospheric nitrogen, are strictly speaking perhaps outside the range of our present discussion although as these processes take place in the soil and are connected with the use of nitrogen contained in the soil atmosphere, and have no connection with the addition of nitrogen in the form of fertilizer to the soil, it appears fitting to consider them.

Outside the question of classifying the micro-organisms as members of the vegetable kingdom, plants may be divided into two classes, namely, nitrogen consumers and nitrogen gatherers. The former obtain their nitrogen from the soil in the form of nitrates, while the latter gather their nitrogen from the atmos-

phere through the agency of parasitic bacteria which are found in the nodules on their roots. Practically all plants belonging to the family *Leguminosae* are nitrogen gatherers, such as peas, beans, clover, alfalfa, etc. Each separate genus, and perhaps in some cases species as well, have their own special bacterium, and this bacterium confines its attentions to its own plant. The species of bacterium found in the nodules on clover roots will not work upon alfalfa roots, nor will those found upon peas or beans work upon clover or alfalfa. The bacteria inhabiting the root-nodules of the principal crop plants belonging to the above family have been isolated and cultivated separately, and can now be obtained through trade channels for the purpose of inoculating the seed of any species or the soil upon which it is to be grown so as to be sure that such plant's special bacterium is present.

This inoculation is, however, frequently barren of results from want of recognition of the fact that, in common with those previously mentioned, these bacteria must have right soil conditions for the carrying on of their work. As they obtain the nitrogen upon which they work from the soil atmosphere, aeration of the soil is, of course, absolutely necessary; there must also be a supply of phosphates and potash, with sufficient lime to prevent acidity. If any one of these conditions are absent, or any distinctly adverse conditions, such as want of drainage, present, then all the inoculation in the world will be useless.

Crops of this family of plants always enrich the soil in nitrogen, even when entirely removed from it, and a crop of clover turned under will add some two hundred pounds of nitrogen to the acre, which nitrogen would cost today in the form of nitrate of soda, about eighty dollars. We see at once what great opportunities the gardener and the farmer have to obtain their nitrogen almost for nothing, if they make leguminous crops serve as the source of nitrogen for crop production. It must be borne in mind that the nitrogen in the clover or other similar crop turned under does not become available until acted upon by the nitrifying organisms first mentioned.

Another source of available nitrogen is to be found as the result of the activities of certain free-living bacteria which have the power of fixing atmospheric nitrogen on their own account and do not require the co-operation of a living plant. The work of this class of micro-organisms has not yet been followed so closely and so finally as with the others previously mentioned. Their existence and initial work upon free nitrogen is known, and their activities require the same environment as do other nitrifying organisms.

Unfortunately available nitrogen as such does not remain long in the soil, that which is not used by the plant being easily washed out by rain. Also the reverse of nitrification, namely, denitrification, may take place and is the result of the workings of a class of organisms which act upon the nitrates, forming free nitrogen which is liberated as gas. One of the conditions for denitrification is the absence of oxygen. Denitrification occurs in soils saturated with water and where the soil is so compacted that air is practically excluded.

It is not possible to store our soils with *available* nitrogen as it does not, as is the case with other plant foods, undergo fixation. Fixation is a chemical change taking place in the soil whereby a plant food in an easily soluble form, like nitrates, undergoes a chemical change and becomes less soluble, but which is at the same time, as a rule, in an available condition or may readily become so by cultivation, and in this state the plant by the acid secretion from its roots is free to render soluble in quantities and at times desired.

This non-fixation causes a great loss of nitrogen to take place when the ground is bare, as in the cases of a bare fallow, and when a cover crop is not used in the Autumn after the crops for use have been removed.

In addition to the micro-organisms which carry on the work above mentioned there are a great many others, some of which are beneficial while others are in various ways harmful, to plant life. There are some of the latter which are injurious by reason of the fact that they prey upon those which carry on the work of nitrification. In a general way conditions which are harmful to the beneficial bacteria are such in which the harmful bacteria thrive. An accumulation of partly or entirely undecomposed vegetable matter in the soil, and the soil condition known as "sick" due to continuous heavy manuring, all encourage the growth of the harmful bacteria, as do also undrained and badly cultivated soils, the want of lime and any other soil condition harmful to higher plant life.

These harmful bacteria preying upon the nitrifying organisms are, while microscopic, of a considerably larger size, which size causes them to be more susceptible to conditions which are harmful to bacteria as a class, such as extremes of heat and cold. This enables us to adopt measures of partial sterilization of the soil by which the harmful species are killed. Exposing the soil to severe frost is destructive to them; the same effect is brought about when "sick" soils are treated with quick-lime; they are

more or less destroyed when a bench of soil in a greenhouse is allowed to dry out all the Summer, and treating soils with steam while killing harmful organisms leaves at least some of the beneficial ones unharmed, otherwise the great good which a soil derives from the steaming process would not come about.

In many parts of the world, especially in India, brush is burned upon the surface, a process which greatly benefits succeeding crops, an effect which is undoubtedly brought about by the heat from the burning brush destroying the harmful organisms. Such organisms may be also killed by the use of germicidal preparations applied to the soil.

Experimental work at Rothamsted and elsewhere has repeatedly brought out the fact that conditions harmful to life in the soil, such as extremes of heat or cold, use of liquid germicides, and so on, always lead to greater activity on the part of the beneficial organisms as soon as such harmful conditions have passed, owing to the fact that such conditions have at least considerably decreased the numbers of those bacteria which prey upon the beneficial ones.

All soils worth cultivating contain a large supply of phosphoric acid, the proportion of it which is available will depend upon the treatment which the soil has received. The store of phosphoric acid in the soil is always in some form of phosphate, in the absence of cultivation, etc., it is generally and largely in the unavailable forms of phosphates of iron and alumina. The production of available phosphoric acid is mainly brought about by chemical action, such action being set in motion by cultivation, green manuring and the application of lime. So far as is known the soil micro-organisms have no direct action in this direction, but doubtless their work in the way of breaking up animal and vegetable residues has considerable indirect action.

Lime is what is known by chemists as a very active base. When it is added to the soil it seizes upon the phosphoric acid contained in the phosphates of iron and alumina and forms phosphate of lime, which easily becomes available as actual plant food.

Unlike available nitrogen, available phosphoric acid is not easily washed out of the soil, although under certain conditions it does sometimes revert back to its unavailable form, but this of course involves no actual loss. When it is necessary to apply phosphoric acid to the soil, as might be the case for instance when ground has been neglected, it is best to apply it by means of fertilizers having an organic origin, of which ground bones is an example, and the finer they are ground the quicker will be their action. Phosphoric acid of an inorganic nature, such as superphosphate or acid phosphate, is not so good as these and has a detrimental effect upon the nitrifying organisms.

With regard to potash, this important plant food is present in abundance in all soils worth cultivating, and it is never, or very rarely, necessary to apply it, still less is it necessary to import it into the country so far as feeding plants is concerned.

It is present naturally in the soil in a very insoluble state, generally as a complex form of potash and alumina. In this case, too, lime is an important medium of bringing it into an available form, as when this active base comes into contact with dormant compounds of potash it takes the place of the potash, which, being thus liberated, goes into solution and becomes available for the plant. In this connection, sulphate of lime (gypsum) is more active in regard to potash than carbonate of lime. There is practically never any soluble potash in an acid soil, and soils in this condition must first have their acidity removed before the lime can act upon the potash. Rocks known as feldspar and also granite are very rich in potash and there is generally a superabundance of it in all soils formed fundamentally by their disintegration.

It will have become apparent that the application of lime is necessary in connection with the production of the available forms of all of the three important plant foods, nitrogen, phosphoric acid and potash, and it is only for this purpose that it is really necessary to apply lime, as plants use very little of it as actual food and all soils contain an abundance looked at from this point of view only.

A British agriculturist wrote some 400 years ago, "Tillage is manure." His observations showed him that land well tilled, receiving little or no manure, produced better crops than that receiving an abundance of manure but little cultivation.

In connection with all plant foods contained in the soil continual cultivation always tends to render them available. As much of the breaking down of the original rocks was brought about by the action of weather changes, exposure of the soil to the weathering action of Winter frosts is another active agency in producing available plant food. The presence of organic matter in the soil is also another active factor in this direction. This organic matter can be cheaply supplied by the turning under of green crops. The fact that organic matter is a very potent agent in the breaking up of insoluble plant foods, is doubtless due to the amount of carbon dioxide formed during the decaying process of vegetable matter, such as green manures; this

carbon dioxide renders mineral matter more soluble. Also the organic matter forms a medium for the growth of various bacteria, ferments, etc., which assist in breaking down soil components.

Stable manure, while being a direct plant food, is equally as valuable for its indirect action in assisting very materially in unlocking dormant phosphoric acid and potash already contained in the soil.

While we are not advocating the entire discontinuance of manuring, a greater dependence upon the practically inexhaustible supplies of potash and phosphates in the soil and of the nitrogen in the atmosphere by taking the steps necessary to render them available and less dependence upon purchased plant foods, will be found to produce at least equal results at a considerable reduction in cost.

THE SAMENESS IN GARDENS

I NOTICE in your "Here and There" column of July number just received the writer deprecates the formal Gardens of which we have got so tired in favor of something more natural. No doubt they have even now their place in large establishments where all sorts of gardens can be indulged in. But it is in the small villa gardens which are to be seen by the thousands in the suburbs of our cities, that formalism and sameness seem so pitiful. Where as soon as Spring comes a row or two of Lobelias, Geranium, Calceolarias, Alyssum or Marguerites are just put out and for about two months or so in the middle of Summer are just bright and gay. But one soon tires of the row of red, white, yellow and blue and all interest in the garden is lost and add to this the miles of Privet Hedges which have to be clipped every few weeks. Oh, my, the sameness of it all! But it is fashionable for the bedding out to be done and so it is done and oftentimes the plants are left till every one is killed by Frost and the bedding out time comes round again.

I know a front garden of a detached suburban villa in which for at least eight months there is always something worth looking at. It only measures 36 by 24 feet, includes a grass plot and rockery and in it are more than 100 varieties of plants, and passers-by invariably and habitually look over the low fence to see what is newly in bloom, and often pull themselves up sharp to see something strikingly fresh or distinct.

The front of the house is well covered with Red *Pyra-cantha*, backed on one side with *Ceanothus dentatus* and on the other with Clematis Jackman, Tamarisk and Rose Crimson Rambler. In middle of the grass plot is an oval bed planted with Rose Antoine Rivoire, but also filled with Forget-Me-Not, Asters, Wallflower—and now most effective of all, *Lobelia cardinalis*. It is quite a picture for months. The rockwork is prettily covered with such things as Dwarf Veronica, Red Valerian, Primroses, Polyanthus-Crocus, Cat Mint, *Heuchera sanguinea*, Sedums, *Lithospermum fruticosum*, Funkias, Arabis, It has *confolia*, Hardy Ferns, *Cerastium*, Aubretias, Gentian, Violas, Saxifrage, *Pulmonaria mollis*, *Verbena chamædroides* in the front and on either side are standard double white Lilac, Standard Golden Privet, White and Crimson Rhododendron, Gum Cistus, Silver *Euonymus*, *Acer Polymorphum Atropurpureum*, *Bambusa Fortunei*, Phlox, Hydrangeas on either side, Rose Tea Ramblers, Dorothy Perkins, Yellow Broom, *Erica verticillata*, *Salvia patens*, *Lygustrum Henryi*, *Buddleia variabilis*, Magnifica Rose Hiawatha, Golden Rod, Daffodils, Foxgloves, Helianthemums, *Azalea mollis*, etc., etc., etc.

As I said before over 100 varieties and only 3 Geraniums and 2 Fuchsias that will not stand the Winter.

The owner thoroughly enjoys "messaging about" as he calls it in his garden—pruning this, tying that and chatting with neighbors as they pass by. Truly a big lot of fun can be gotten out of a little garden. H. A. B.

LONDON, England.

Departments of Foreign Exchange and Book Reviews

New Roses at Bagatelle.—We have already announced (June 19,) the fact that the Gold Medal at the Bagatelle trial of new Roses this year was awarded to Rose Frances Gaunt, and we now have particulars of the other awards. Certificates of Merit were given to President Parmentier, sent by Sauvageot, a cross between Colonel Leclerc and Le Progres, pinkish Apricot color very strong and free-growing; *Le France Victorieuse*, an H.T. hybrid sent by the Rosary of L'Hay, pale pink with a slightly deeper heart, very large petals; *Comtesse de Cassagne*, another H.T. from the firm of Guillot, petals ivory-yellow outside, lightly suffused with pink inside, very strong in growth and with a long season of flowering; and Mermaid, an interesting hybrid obtained by crossing *R. bracteata* with an unnamed Tea Rose, the large flowers are pale-yellow.

I am not surprised to hear that *Rosa Frances Gaunt* won the premier award at the Rose trials at Bagatelle. It is one of the best of the new varieties. The habit of growth is all that could be desired; vigorous, carrying the blossoms erect on stout stems, which renders it all the more useful for garden decorations. The color is deep apricot.—*The Gardeners' Chronicle of London.*

Rose Competition at Bagatelle.—The new roses sent out in 1919 have been very numerous, in spite of the difficulties of all sorts, and many of them are very beautiful. The choosings for the Gold Medal and for the certificates have been very difficult.

Souvenir de Claudius Pernet.—*The Gold Medal*—is a grand rose of pure chrome yellow held up on a stiff stem. The bush is very vigorous and extremely floriferous. The name was given by Mons. Pernet-Ducher to perpetuate the memory of his eldest son gloriously fallen on the field of battle. Its vigor and the color, a pure yellow and the good form make it very remarkable.

In the competition of next year we shall find an admirable rose bearing the name of the second son whom the war has taken away from this unfortunate father.

Another yellow rose of Mons. Pernet-Ducher, *Benedicte Seguin*, with large petals, very beautiful in the bud was noteworthy; its color, very different, is golden yellow; the beautiful foliage is dark, the stem stout and very long; it is more of a H.T. than a *Pernetiana*; it has moreover the delicate and penetrating perfume of the hybrid teas, a quality deserving to be noted in a yellow rose, especially in one so strongly colored as is this. (*First-class Certificate*).

The Gold Medal for roses of foreign origin was assigned to Frances Gaunt, of Alec. Dickson.—*Le Jardin.*

PAPAVER SHIRLEIENSE.

If it were my fate (as in these days I could almost wish it were), to be Crusoe on the Island of Juan Fernandez, and did the power that marooned me leave me but a single flower to solace my captivity, I should say: "Give me then, tyrant, a pinch of Shirley Poppy seed"; and the first phrase I should teach my parrot would be, "Hurrah for Wilks and Liberty!" With Orchids and Roses, Tulips and Passion Flowers, Dahlias and Delphiniums to choose from, it may seem a curious lack of discrimination to single out the "harmless necessary" Poppy, this lightly held, unconsidered annual, but yesterday a member of the despised proletariat of weeds, exposed to the harrowing persecutions and oburgations of farmers and their hinds—to choose this field Arab for the sole ornament and glory of my Pacific island; this surely, if only in the interests of sanity, would stand in need of justification. To begin with, if I am to have but one flower, it must needs be a flower likely to be in evidence throughout a large part of the twelve months—seven or eight months of the twelve at least. Next I choose these Poppies as giving the minimum of trouble and anxiety; no nursing or coddling, no strapping and wrapping and swaddling in Sphagnum as if they were babies or Orchids, no striking, or grafting, or budding or layering as if they were Roses or Carnations, no truck with tubers as if they were Dahlias, no lifting and repainting of bulbs as if they were Tulips or Daffodils. No! none of these troublesome operations! Just fling your pinch of seed broadcast on the wind, and there you are! I dare say that the Poppy is not averse to rich diet, though it thrives none the better for battenning on the fat regimen of Broccolis or Dahlias. I have no doubt it would take to a nitrogenous diet as readily as a beggar to *pâté de foie gras*; but it is not the better for it. On over rich food the Poppy tends to become gross and obese, with a susceptibility to dropsy or gout. In short, the Poppy does itself more credit on a me-

dium soil; if light and gravelly, perhaps, all the better. Fling it on any spot where Chickweed is happy (and where is not Chickweed happy?), and the Poppy will spring into life, and grow space, and flower in flamboyant splendor, and produce seed a thousandfold and die, and rot, and, in response to the first shower after its decease, will spring into new life and a glorious re-incarnation. There are only three troubles with this Poppy, the thinning, the staking and the gathering, but these, especially the last, are greater than the inexperienced would be ready to believe.

The Shirley Poppy is, I understand, descended in direct line from the Poppy of the field, *Papaver Rhæas*. Most people suppose they are familiar with the Field Poppy, and probably they are with a Field Poppy. But *P. Rhæas* is a protean species. Long before the Shirley Poppy was known to English gardens, this extreme variability of the Field Poppy was noted by scientific writers. In a work written in 1857 I find the following remark made about *P. Rhæas*: "By cultivation many beautiful varieties of this species are obtained, both double and semi-double, and of various shades, from rose color to white, and not unfrequently variegated"—which is not a bad description of the Shirley Poppy as we know it now. The Shirley Poppy does not owe its origin, as some possibly suppose, to John Wilkes, who was member for Middlesex and a Mayor of London in the eighteenth century. John Wilkes, by all accounts the most charming man of his time, did not so far as I know, concern himself much with flowers, except indeed, with the Flowers of Rhetoric, to which he gave assiduous attention and which he cultivated with notable success, his Hyperboles, in particular, being of such a robust and vigorous strain, though coarse, as to make quite a sensation at Westminster and Windsor. He had, however, nothing to do with the Shirley Poppy, the origination of which unquestioned tradition ascribes to the Reverend (which the editor of the *North Briton* certainly was not), William (not John), Wilks (not Wilkes). The story goes that Mr. Wilks, Vicar of Shirley, who was secretary to a well known horticultural society, and felt, besides, a genuine interest in horticulture, found one day in his garden what he considered an exceptionally fine specimen of the Field Poppy, *Papaver Rhæas*, that he proceeded to segregate this plant and pay it the attention it seemed to deserve as the possible progenitor of a desirable posterity; that by saving the seed and selecting for several generations, he at length evolved the present glorious race of flowers which, from its place of origin, is named Shirley.

As to the cultivation of the Shirley Poppy there is something to be said, but not a great deal. The necessary counsel is fourfold: (1) Sow in Autumn (September or early October); (2) thin unsparingly; (3) stake firmly; (4) and gather assiduously. I do not say that soil is of no consequence. Like other things, this Poppy will flourish most vigorously and supply flowers of the best quality where the soil is in reasonably good heart. Soil, for instance, that will grow good carrots and turnips will also grow good Poppies. But more important than the richness of the soil are its mechanical properties, a fairly light soil being the more congenial, at least in the early stages. The Shirley Poppy (and probably all Poppies, certainly the Oriental, Opium and Iceland Poppies), opens its flowers only in the early hours of the morning. However brilliant the sunshine, no Poppy flowers will expand during the daytime, that is, after the sun is well up in the sky, say from 8 a. m. onwards, nor do they open during the dark hours of the night. Gather all your Poppies before breakfast today, and you will have no more blossoms till five o'clock or thereabouts to-morrow morning. One of the chief features of interest in the Poppy is its strict adherence to times and seasons, not merely the seasons of the year, but even the hour of the day. Shirley Poppies sown in Autumn may be expected to come into flower in late May or early June, and to be at their best about the Summer solstice, that is, when the days are long and warm. The most convenient way of growing Poppies for purposes of observation is, I think, in the form of a hedge, like a row of Peas, and staked much in the same way.—*The Garden.*

COLOR AND CHEER.

The heritage of Autumn beauty ought to be ours just as much as that of any other season such as Spring or Summer, and although its reign is such a short one it is worth while

to do what we can to secure it. Nature lends her most brilliant colors to dye the falling leaves and ripening berries, making as it were one last dash for beauty before she assumes the sombre garments of the year. Many of the shrubs and trees at our command take part in this pageant of beauty, and by expending just a little thought in selection, some fine autumnal effects and color combinations can be obtained. *Liquidambar styraciflua* (American Sweet Gum) is one of the most satisfactory trees in this respect. A native of the northern United States, it is hardy and affords excellent shade in Summer. From the gray branches hang long stalked, glossy, maple-like leaves of elegant shape which at the first touch of cold run from pale green through gold into a deep crimson, sprays of which mixed with pink dahlias, are a thing to be remembered. The leaves, which are fragrant when bruised, remain on until the first frosts. Seeds (mostly imported) take a year to germinate and when the seedlings are about 6 inches high they should be transplanted into deep, moist loam.

Liriodendron tulipifera (The Tulip Tree) is another beautiful North American tree which not only gives good and striking color effects but is also valuable from a decorative point of view on account of its flowers. These open in Spring and early Summer when the foliage is a soft light green. They are shaped like those of a tulip and are sweet-scented, the cup greenish yellow without and orange within. The leaves borne on this splendidly sturdy tree of which the wide spreading branches often crown an erect stem 60 feet high, are very handsome and distinctive, with two lobes at the base and two at the apex, separated by a broad shallow notch. In Autumn they are a rich golden yellow. In Great Britain the trees are found to thrive under very varied conditions as regards soil but a good deep loam in a sheltered situation is most desirable. Other trees for Autumn effect are *Quercus coccinea*, *Acer saccharum* and *Cornus fibrida*, which sometimes has its glowing tints augmented by the presence of scarlet fruits; whilst amongst shrubs we have *Euonymus alatus*—the Japanese Burning Bush,—*Berberis vulgaris*, *Sambucus*, and the many attractive species of *Sambucus*.—*South African Gardening and Country Life*.

ANDROMEDA (PIERIS) FLORIBUNDA.

Those who live on poor, peaty soils have at least one advantage in that all the charming small shrubs that we know under the general garden name of *Andromeda* can be grown to perfection. One of the earliest and most lavish of bloom is *Pieris floribunda*, a stiff, woody shrub covered in early April with its pretty white bloom. It has the unusual habit of forming its flower-buds in early Autumn, when, quite six months before its time of blooming, it has all the appearance of promising to be in flower within a fortnight. It grows to a height of 6 feet to 7 feet, then taking a form between bush and small tree. We have it by one of the several paths that lead from garden to wood, in company with *Gaultheria*, *Skimmia* and the dwarf alpine *Rhododendrons*, all plants that thrive in our light, sandy soil.—*The Garden*.

THE POPULARITY OF TUFTED PANSIES.

A summary of some of the dwarf plants used for Summer planting in the flower garden in a recent number makes one realize how much the Tufted Pansies predominate for such work in the majority of gardens. When one sees them in mass in scores of varieties thoroughly well done there is no question as to the reason for their popularity, because, in addition to their freedom and long-continued blooming season, they give in their variety almost every shade of color with the exception of scarlet, and this has led to the exclusion of many dwarf plants largely used at one time but now shelved in favor of the Pansies, as the dwarfiest *Ageratum*, *Gazania splendens*, *Tagetes pumila*, and the white *Alyssum*. Those retained either supply a shade unknown in the Pansies, as in *Linum grandiflorum*, or have a peculiarity of their own, as in *Cuphea platycentra*. A grand point in favor of the free use of these Pansies is their adaptability to association with so many different plants, both hardy and tender, as Roses and Pentstemons in the one and Fuchsias and Begonias in the other, and many other things classed as *bona fide* greenhouse or stove plants that are occasionally used in the flower garden. I noted above the free and continuous blooming of these Pansies, but it must be remembered that this is only obtained by liberal culture and making sure that the soil is always fairly moist, the latter secured by a good soaking and a surface mulching if the weather prove hot and dry. In addition to the many different shades commonly known and planted, some new varieties have been introduced in recent years in copper and brown which serve as capital carpet plants to Roses of similar hue.—*Gardening Illustrated*.

WHITE FOXGLOVES.

One of the many interests of the garden is the gradual bettering by selection of some kind of flower. Among a batch of white Foxglove grown some twenty-five years ago there came one absolutely without spot of any kind. It is usual for them, even when colored spots are absent, to have some kind of faint spotting of pale buff or brown; but the unspotted white one was isolated, and every year there were more of the pure white. Now the strain may be considered fixed, for though there may still be here and there the faintest trace of spotting, one may say that quite 95 per cent will be pure. The whole growth is handsome, the spikes well over 7 feet in height and of good form; the individual bloom held in the hand might almost pass for a white Gloxinia. It is a plant for many uses; in patches in garden borders or among shrubs, but best of all in woodland. When a tree is grubbed, leaving a space of loosened soil, we sow the white Foxglove, and in two years time there is a noble group of the pure white spires.—*The Garden*.

HOEING IN DRY WEATHER.

The amateur gardener is at first inclined to be rather sceptical about the advantages of hoeing in times of drought. He does not see how it is that breaking up the surface soil is going to prevent his plants from drying out. The constant use of a hoe is worth any amount of watering.

Any soil, whether it be light or heavy, is composed of countless numbers of minute, almost spherical particles, the water forming almost continuous channels from the lower levels of the soil to the surface. When evaporation is taking place at the soil level, as it is always doing to a certain extent, and to a greater degree in hot weather, a stream of water is continuously being drawn up to take the place of the moisture evaporated at the surface, and the reserve water a foot or so down gradually becomes exhausted as it travels up to be dried by the sun's rays. By breaking up an inch or two of soil at the surface with the hoe these continuous channels of water are disturbed and broken through, and the moisture ceases to be drawn up by the action of the sun. A loose layer is provided at the surface through which the water only rises upward with difficulty, as the further apart the particles are the more difficult it is for the water to form continuous channels. This continuous hoeing in dry weather conserves the moisture in the lower soil levels, where it is available for the roots instead of its being evaporated into the air and lost to the plant.

So if you are afraid that your vegetables are suffering from drought, ply the hoe vigorously and leave the watering can severely alone.—*Gardening Illustrated*.

PEACH LEAF CURL.

Having regard to the ease with which Leaf Curl of Peaches is controlled it is remarkable how wide-spread this unsightly malady remains. So long as it was supposed that the mycelium of the fungus (*Ectoascus deformans*) perennates in the tissues of the Peach tree, and growing with the new shoots infected them in turn, it seemed hopeless to attempt to check the malady by spraying. But a crucial experiment made some years ago at Wisley showed, nevertheless, that spraying may serve to arrest the disease in the most strikingly peremptory manner. A row of Peaches trained against the south side of a wall was chronically affected with Leaf Curl and almost completely unfruitful. It was decided to test the effect of spraying with Burgundy mixture, which had been used already with marked success by Dr. Horne in controlling American Gooseberry Mildew. In order to secure if possible a decisive result, one-half only of each fan-trained tree was sprayed. The work was done in the early Spring, just before the buds were about to expand. The result was remarkable. As the new foliage developed that on the sprayed half of the tree was as clean as the hand of the healed leper—that on the other was distorted and discolored after the drastic fashion of leaf-curlled foliage. The conclusion was therefore plain: that the Spring infection is the result of the germination of spores shed from diseased foliage during the previous year, and lodged in or between the bud scales where they hibernate, start into growth as the buds expand, and infect the young foliage. When this mode of infection is understood it is easy to realize also how it is that Spring weather acts so often as the deciding factor—determining whether infection shall take place or not—for the spores are minute and are likely to infect the tissues of the leaf only under conditions most favorable to them. These conditions are either moist air and developing leaves gorged with water or dry air due to winds, with consequent injury to and reduced resistance of the young foliage. Hence it is that the gardener is apt to attribute Leaf Curl to adverse Spring weather and to ignore the fact that it is only a contributory and not a prime cause of the disease. In view of these facts two conclusions may be drawn—one with cer-

tainty, the other provisionally; the former, that by Spring spraying, Leaf Curl may be abolished from our gardens; the latter, that spraying in late Autumn or Winter after the leaves have fallen may prove to be as effectual and possibly more convenient than spraying in the Spring. It is to be hoped that experiments on these lines will be made and also that mycologists will complete their inquiry into the life history of this disease by ascertaining in what state the spores rest during the Winter. The Burgundy mixture which was used at Wisley was composed of $\frac{1}{2}$ pound of copper sulphate, $2\frac{3}{4}$ pounds of sodium carbonate and 12 gallons of water.—*The Gardeners' Chronicle of London*.

THE BULB SCHOOL, LISSE, HOLLAND

Situated on the outskirts of the village of Lisse, and in the very heart of the bulb-growing district, stands the Government Bulb School, where students receive a very thorough education and technical instruction in the practice and principles of bulb cultivation. The aim of the school is to instruct youths in the very complicated business of bulb growing and also endow them with a sound education.

Before entering the school a youth must have had at least six months' experience on a bulb farm to enable him to understand the meaning of the technical terms employed in the industry and to bring him into contact with real processes, with men at work, and with the great current of the world's industrial life. Having submitted himself as a candidate, he must then pass an entrance examination and show knowledge of such subjects as Dutch grammar, mathematics and geography. The standard required is about equivalent to that needed to pass the Cambridge or Oxford Junior Local Examination. The candidate, however, must have an elementary knowledge of three languages—English, French, and German—as languages necessarily play a very important part in the trade of the bulb grower, since his business is one of exportation to the British Isles, Scandinavia, America, France, Russia, Germany and Austria.

The course of study at the school lasts over a period of three successive years. During the flowering season of bulbs the students are given one month's vacation, wherein they have ample opportunity to study the flowers and the habits of the varieties, as well as to help with the operations on the farms at that season. Again, in the lifting and planting season they gain further experience in the field and in the warehouse and office.

From October to May instruction is given in the school. The subjects are many and varied. Pure and applied botany, with special reference to bulbs, is a principal subject, and instruction is also given in horticultural physics and chemistry. Special teaching is given in bulb cultivation, particularly of Hyacinths, Tulips, Narcissi and Gladioli, while such operations as cross-breeding, planting, lifting and warehouse management receive detailed attention. The student is also trained to recognize the diseases and pests affecting Dutch bulbous crops and the method of controlling them.

Correspondence, office administration, bookkeeping, as applied to a bulb farm and business, surveying and commercial geography are also included in the syllabus and all these subjects are compulsory. The student may also receive additional instruction in the English, French, Scandinavian, Russian and German languages and correspondence. If he wishes, he may study all these five languages. Typewriting and stenography are optional subjects. The school examination is held at the end of each year.

The Dutch Government has entered heartily into the business of educating youths to take an important standing in a profession which means so much to the country. Holland is regarded as one of the most productive countries in the world and in bulb growing it certainly takes the lead. The bulb growers have much in their favor and can perform cultural operations which are commercially impossible in this country. The degree of proficiency which the best growers have reached is marvelous, but there should be finer results, as the school succeeds in equipping youths with sound, practical knowledge, specially adapted to the business they are to enter.

Not only does Holland possess a special school for bulb culture, but in other parts of the country there are schools where a complete training is given in other branches of commercial horticulture. To the writer it appears that this system of commercial education is admirable and the time may come when the horticultural student in the United Kingdom may demand an opportunity, at very little cost, of gaining a business and scientific insight into whatever branch of the huge industry he decides to enter.—*The Gardeners' Chronicle of London*.

THE DOUBLE WHITE NARCISSUS

A quarter of a century or more ago its failing to flower was much discussed in gardening journals by leading market men and prominent amateurs, who variously attributed it to "late spring frosts," "drying east winds," and things akin

after the flowering scapes were prominent above ground. These superficial views I never favored. At the time I grew it on a large scale—many thousands of it—and was as much disappointed as the rest at the fewness of good flowers which resulted from fairly generous cultivation. Blind flowers, so-called, were abundant, albeit the foliage was healthy, the scapes (flowering stems) strong. These facts set me thinking. The variety flowered late, i. e., in May, when conditions of dryness and increasing solar heat were but natural. The soil was good, light loam, fifty years old pasture recently brought into cultivation, though much drained by reason of a deep bed of gravel and sand below, which in Summer rendered it dust dry. With such conditions obtaining, it was noticed—and the fact would be obvious to the most casual observer—that leaf maturity in the case of the Double White was much earlier reached than was the case with other sorts flowering weeks in advance of it, and, knowing that in the Narcissi the germ of any season's flowering is virtually laid with the maturing of the leaf growth in the previous year, caused me to decide that I had touched the root of the whole matter. In other words, I decided that the late flowering of the variety, the much-drained soil, absence of atmospheric and root moisture, with increasing heat combining to an appreciably shortened period for the maturing of bulb and foliage, were the chief factors of the failing. In fine, that imperfectly-formed flower-buds being laid, blindness was assured practically a year in advance of its becoming apparent. Subsequent experiments with bulbs in pits sheltered from the weather and treated on a semi-aquatic plan proved the contention right. A year or two later, in a private garden I came upon a few scattered groups of it at a pond-side and in fine flower. Its owner had thoughts of filling in the pond, and I was on the spot professionally with a view to suggesting an alternative. From inquiries I found that the Narcissi had been there for years, and without care or attention came up and flowered well annually. In Winter they were many times under water, and at other times always in cool or moist soil.—*Gardening Illustrated*.

Voie Lactée with its large, pure white, single flowers, is probably the finest single white in cultivation, the flowers are powerfully scented, stamens golden-yellow. The variety *purpureo-maculatus*, with its dark patch of rosy-purple in the centre of each flower and its delicious spicy fragrance, is certain to become a favorite in time. Virginal is the finest double form of *P. Lemoinei* in cultivation. It has dense clusters of large, pure white flowers. Even those who do not as a rule care about double flowers are carried away by the great beauty of those of Virginal. All three varieties are very fragrant, the spicy odor of *purpureo-maculatus* being very pleasant in the garden in the evening as it is carried about in Summer breezes. The flowers for this year will, alas, soon be a thing of the past. As soon as they are over, the old flowering wood will be lightly thinned out.—*The Garden*.

Seed pods on Rhododendrons.—It would be greatly to the advantage of Rhododendrons if the fact were more generally recognized that the development of a mass of seed pods inflicts a great strain on the plants. It will be found of great service to the plants if the pods are removed as soon as the blossoms are over. This applies even more particularly to the choice varieties, which are probably obtained in the shape of small plants.—*Gardening Illustrated*.

Single Roses.—These have a charm of their own. Some of the free growing varieties such as Irish Elegance can be effectively cultivated as specimen plants if lightly pruned each year. Amongst the newest introductions are Isobel and Ulster Gem, both holders of the gold medal of the N.R.S.

Isobel is fragrant with carmine red petals surrounding a golden heart of pure yellow.

Ulster Gem is a deep primrose yellow with prominent anthers. The long pointed buds open into flowers sometimes 6 inches across.

Climbers.—A word of warning has to be uttered with regard to "climbing sports" developed from dwarfs, now becoming more numerous every year. On the part of some of these there is a sort of unstable quality resulting often in reversion to the dwarf habit. Experience in the cultivation can be the only determining guide as to which are of fixed habit.—*South African Gardening and Country Life*.

Moss Roses.—A pretty posy of Moss Roses in a vase seen recently was a reminder of this old flower's popularity among those who sported "buttonholes" about thirty years ago. Large quantities of blooms and mossy buds came into the flower markets in those days, bunches being sold at a few pence apiece. It was a great favorite in gardens, but of late has become a rarity, displaced no doubt by the numerous fine Roses and other choice plants introduced during the past few years. It deserves a place in the garden and in the public parks like Dulwich and Peckham Rye, where Roses do so beautifully. There are several kinds, which vary in color; but the old common Moss Rose should never be omitted from a collection.—*The Garden*.

National Association of Gardeners

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THE GARDENERS' CONVENTION

The plans for the annual convention, which will be held at the Hotel Marquette, St. Louis, September 14-16, promise to make it the most successful meeting in the history of the association. Important matters relating to the gardener personally—his profession, his association and on ornamental horticulture in America, will be acted on. A full report of the meeting will be published in the October number of the CHRONICLE.

SUSTAINING MEMBERS

Mrs. J. J. Albright, Buffalo, N. Y. (Alexander Reid, gardener); Mrs. Eugene Meyer, Jr., Mt. Kisco, N. Y. (Charles Ruthven, gardener); Mrs. Gustav E. Kissel, Morristown, N. J.; Mrs. John I. Waterbury, Convent, N. J. (Thomas Hughes, gardener); Mrs. Charles S. Guggenheimer, West End, N. J.; Mrs. Arthur Lee, Elkins, West Va. (W. H. MacDonald, gardener); and E. C. Converse, Greenwich, Conn., have recently become sustaining members of the association.

SERVICE BUREAU PUBLICITY FUND

The following contributions have been received toward the Service Bureau Publicity Fund up to August 31:

Previously acknowledged	\$1,397.00
Robert Barton, New Haven, Conn.	2.00
R. Boxel, Sewickley, Pa.	2.00
Edward T. McCarroll, Alpine, N. J.	5.00
Edwin Saunders, Lake Forest, Ill.	5.00
John B. Traquair, Lenox, Mass.	2.00
Gustav Beekman, Long Beach, L. I.	3.00
Francis Lazenby, Marion, Mass.	2.00
William Barron, Maplewood, N. J. (additional)	10.00
Hamilton Scott, Short Hills, N. J.	5.00
E. S. English, Pomfret, Conn.	2.00
George Jacques, Cleveland, O.	5.00
Arthur Adams, Havre de Grace, Md.	2.00

Total\$1,442.00

AMONG THE GARDENERS

Thomas W. Head, who recently resigned his position as superintendent of Melody Farm, Lake Forest, Ill., accepted the position of superintendent on the estate of Herbert Straus, Red Bank, N. J. William J. Devery secured the position of gardener to George Fearing, Westwood, Mass.

Fred Duncan secured the position of gardener on the estate of Mrs. C. M. Goodyear, Buffalo, N. Y.

James Lyon accepted the position of gardener to Miss M. M. Hall, Northport, L. I.

Philip J. Lucking, who has been gardener to C. K. G. Billings, Oyster Bay, L. I., has been appointed gardener on Mr. Billings' estate at Santa Barbara, Cal.

COMMENTS ON THE GARDENER AND HIS ASSOCIATION.

This account of the gardens visited cannot end without a word for the gardeners who have so large a share in the making of a successful garden. They must have worked very hard to achieve the perfect finish each garden showed, and their willingness and intelligence in answering questions, showing favorite plants, spelling complicated names and giving cultural suggestions added much to the practical enjoyment of the visitors. After all, the gardener who puts his conscientious labor and personal interest and enthusiasm into a garden becomes part owner of that garden, and to him as well as the actual owner we owe thanks and appreciation.—*Garden Club of America Bulletin*.

"The Breeze representative who 'covered' most of the gardens visited by the Garden Club of America talked with many a gardener while making the rounds. In not one case was any one disgruntled or talking about extra work. Each was getting his place spick and span in anticipation of the visitors. One gardener, after it was over, said he was eating his supper at 9:30 that night in place of 6. But all were happy and good-natured over it, and truly the gardeners had their day this week with the big show on in Manchester, and the Garden Club visitors spinning around everywhere over the Shore. Why can't all workers be as pleasant, happy and enthusiastic as the gardeners? Suppose we all take a lesson from them."—*North Shore Breeze Reminder*.

The connection between private and trade horticulture is closely maintained by what may be termed an intermediate section, namely the professional gardening fraternity. The professional gardener is a power in the world of horticulture; without him the wealthy could not maintain gardens of any pretensions, and without such gardens the seedsman and nurseryman would find much of his trade cut off. The professional gardener is unlike any other class of worker employed by others for pleasure purposes, for he is a producer, not a spender. The chauffeur and most other domestic servants merely give service; the gardener gives service and confers pleasure of an elevating character, doing much for trade and world benefit; he is not a menial but a privileged companion. For these reasons we invite attention to the program of the coming convention of the N. A. G., a society which is continually progressing in its work of raising the status of the private gardener in the estimation of his employer.—*The Florists' Exchange*.

Judging from the interesting subjects proposed for discussion in the program, the annual convention of the National Association of Gardeners at the Marquette Hotel, St. Louis, Mo., September 14 to 16, will have some live sessions. For several months past the St. Louis Association of Gardeners has been looking forward to this event and preparing for it; the convention's success will owe much to the industry of the local committees. The effectiveness of the meetings will be increased if those members of the association who cannot attend and have ideas or suggestions to be brought before the convention, will communicate with M. C. Ebel, the secretary, at his New York office, before September 1.—*The Florists' Review*.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you tell me where I may obtain Saponin, referred to in a recent issue of "Gardeners' Chronicle," to use in connection with lime sulphur.—A. M.—Mich.

SAPONIN, recommended for improving the spreading quality of lime-sulphur solution, can be obtained through any druggist from the Mallinckrodt Chemical Works, St. Louis and New York, and from probably other manufacturers of chemicals. For the writer it has worked with apparently excellent success. For a quart of the spray it is sufficient to use as much of the powder as can be held on the point of a small knife-blade. A teaspoonful should be enough for five gallons. It costs about 50 cents an ounce.—F. P. M.

Here and There

AMERICAN DAHLIA SOCIETY SHOW.

When the doors of the Roof Garden of the Pennsylvania Hotel are swung open on September 27, 28 and 29, there will be a vista of beauty that in Dahlias has never been equaled in this or any other country. We expect that the immense hall will be filled with wonderful Dahlia blooms, not only from the fields of commercial growers, but also from the various garden clubs and professional amateur gardeners from far and near. New York is a few hours by train or automobile of the main growing Dahlia sections of the East.

The different garden clubs within an accessible distance have asked the privilege of exhibiting at our show in competitive exhibits instead of having sectional shows at different points, thinking this will give them the opportunity to see what the other clubs are doing.

This was suggested by Mrs. John W. Paris, president of the Park Garden Club of Flushing. Hundreds of Dahlia growers will be brought together that would otherwise never meet.

A few years ago we lost our beloved secretary, J. Harrison Dick. Shortly after his death someone suggested that the best new Dahlia brought out be named after him. This Dahlia was produced by a woman member of the Dahlia society, Mrs. Charles L. Stout, of Short Hills, N. J., a great worker and lover of the Dahlia. After receiving the premiums and growing and exhibiting it again the second year, she kindly donated the entire stock to be propagated and sold for the benefit of the Dahlia Society. This beautiful Dahlia with hundreds of other splendid seedlings will be exhibited at the coming show and we are looking for wonderful results from this meeting.

Today there is no more wonderful flower grown by the gardeners with such changing results both in color and formation as the Dahlia. Some of the artists of the Florist Fraternity have promised some elaborate florist designs showing the many uses the Dahlia flower can be put to. Boxes of flowers, vases, stands, table designs and other artistic features will be shown.

RICHARD VINCENT, JR., President.



Get This New Ten-Ten

Remember how last Spring, you kind of laughed behind your hand when we started telling you about a new kind of seed and nursery catalogue called "The Ten-Ten"?

You laughed first. But we laughed last. You laughed, because you thought we had a laughable idea that ought to be laughed at. We laughed because it developed such a nice, comforting kind of way of ringing our cash register, when every morning's mail came.

If I should tell you some of the things that Ten-Ten Catalogue did, that no catalogue ever did before, you would say we surely were lying. But be that as it may, another Ten-Ten is now ready. It's the Fall planting one. Send for it.

Julius Roehrs

Julius Roehrs Co
At The Sign of The Tree
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LENGTH OF ROOTS.

We seldom look very far below the surface in botany. Roots have so little of beauty that we commonly pay little attention to them unless they are edible. There appears, however, to be considerable diversity among the roots of different plants as regards external characters, though internally they are pretty much alike. Studies carried on in the West show very great differences in the area over which the roots of different species spread. Some, possibly most, occupy the upper two or three feet of soil, but the roots of alfalfa are commonly supposed to go down twenty feet or more in search of water, and those of *Lygodesmia juncea* of the Western plains

have been found penetrating to still greater depths. The palm for such performances, however, must go to the buffalo berry (*Shepherdia argophylla*) which is reported to go down to depths of fifty feet or more. As regards total area covered, the roots of *Ipomoea leptophylla* must be considered. The soil within the reach of this plant is often fifty feet in diameter and ten feet deep.—*American Botanist*.

To love one's friend, to bathe in life's sunshine, to preserve a right mental attitude—the perceptive attitude, the attitude of gratitude—and to do one's work—these make up an ideal life.—*Elbert Hubbard*.

ON PLANTING ROSES

Rose Planting.—In planting a rose we have to consider first the roots of the stock or briar on which the rose proper was budded, second the "union" or point at which the budding was done, third the point on the rose stem where it is to meet the ground line once the rose is safely planted in the ground, fourthly the kind of soil in which we intend to plant our rose, and lastly the rose proper, i. e., the branches which are to give us flowers later on. In spite of all these instructions the amateur need not be frightened, the planting of a rose bush is as easy as that of a fruit tree or any deciduous shrub; but what there is of it needs exact attention if we wish to achieve a full measure of success.

Preparation of Ground.—Should take place some time before you expect the arrival of your plants. Coarse raw soil is no place for rose roots, so, having selected a sheltered position apart from other trees or plants, to avoid closeness which induces mildew—trench 2 feet deep, mixing a fair quantity of rotted cow or stable manure with the soil; and if the latter be old, renovate it by the addition of some good fresh loam.

Decide how far apart you will place your plants.

Next, mark out the bed and make basin-like holes 12 inches deep. Fill these with water and leave for a few days before planting as this should never be done while the soil is wet and sticky.

On receiving your bushes from the nurseryman, undo the wrapping and if unfortunately not ready to plant that day, thoroughly saturate with water and cover with a damp bag, placing them for preference in some dark shed until you can begin operations. If the weather and ground be very dry it may be advisable to dig a shallow trench, fill it up with water, and after this has drained away and you have made sure that the adjacent soil is really moist, heel in for two or three days by putting the roots and part of the lower stems into the trench so that they lie at an angle against one side of it and then fill in the trench again with wet soil. This heeling in is a necessary procedure should the plants for any reason, such as delay, have become very dry during transit. They should at the time of planting be plump and green or a nice ruddy brown. No rose-bush should ever be planted looking dry.

In arranging many varieties in a bed put the weak growers along the front line, the stronger ones to the rear. Look at each tree before planting and if there be any bruised tips to the roots or broken roots, cut these away with a sharp knife. Bone-dust the bottom of each hole, putting a good handful in each, then lay in a nice spadeful of sandy soil and round it over like an upturned saucer. If in a windy region drive in a stake.

Avoid deep planting especially in the case of weak growers which are only of use on the briar roots. For dwarf roses and the ordinary budded ones, place the union of the stock with the bud two inches beneath the soil. Just above this point the rose will then throw out roots of its own in addition to those of the briar which are situated lower down and the plant derive much benefit.

Spread the roots out carefully so as to have nothing crossing. Place some fine soil between and over them, then a little well decayed manure and lastly fill the hole up loosely with the soil. Give gentle foot pressure all round to ensure the necessary

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firmness. Then fill up the hollow thus caused to make top of hole level with surface and tread again.

The shorter you make the stems of your newly planted roses the better. Six eyes are sufficient on each stem. Give each plant a good drenching once a week and mulch, a fortnight after planting, with litter or old manure.—*South African Gardening and Country Life.*

HOW TO KEEP CUT FLOWERS FRESH

The following notes upon the keeping of cut flowers, compiled from official and graduate work carried on at Cornell University, may prove of interest:

1. The factors concerned with long keeping of freshly cut flowers are, proper temperature, humidity, light and ventilation. The temperature should be from 35 deg. to 45 deg. F., cool crops doing better at the

lower temperature. A high humidity (85 per cent) should be maintained by sprinkling the floor of the storage room; this will also help to reduce the temperature, since evaporation is a cooling process. (The notable exception to this treatment is Sweet Peas which are injured by a damp atmosphere.) Light should be reduced to a minimum. A constant and uniform circulation of air should be provided for, to prevent the rotting of the flowers.

2. The average of the results of over a thousand experiments made in this country and in France indicate that Carnations will keep best in a 10 to 15 per cent, Mums in a 15 per cent, Orchids in a 10 to 20 per cent, and Roses in a 7 to 10 per cent sugar solution. Prof. Knudson found that soluble mineral salts in the water greatly retarded (or prevented) the fouling of the water, by their inhibiting effect upon the growth of bacteria.

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This treatment may prove advantageous where the water in the vases cannot be frequently changed. I believe that the laundry bluing (usually a ferrocyanide) mentioned in the Nov. 15 article, would act in a way similar to any other salt in preventing the development of bacteria in the water. There is little doubt, however, but that the daily changing of the water in which flowers are placed is the most efficient and most economical method in the long run.

3. Most flowers should be cut, not broken, straight across the stem, in the early morning when the water content is highest. Of course, Roses and other flowers whose buds open quickly, must be cut twice a day. The longer the stem, the better, since there is more tissue for water storage, and more surface which can absorb water, providing the vases are deep and well filled with water.

4. A heavy application of fertilizers to the plants, prior to cutting, will sometimes send the flowers "to sleep," and may affect their keeping qualities. Heavy fumigations act in a similar way.

5. Clipping the stems under water every day caused flowers to last for 11 days, as against 9 days when clipped out of water.

There are many other pointers, such as charring the stems of Poinsettias, etc., which every florist knows. A great deal depends upon the kind of flower and how it was grown. In general, the problem consists in arresting development, not in feeding the blooms. Flowers and fruits, when cut from the plant, tend to oxidize their carbon to carbon dioxide gas, hence any method which tends to prevent this will tend to increase the keeping. For the florist with a store window, the aim should be to maintain cool, moist and airy conditions, to protect the flowers from intense light, and to use deep vases well filled with pure water, which is changed.—*Florists' Exchange.*

A BALLADE OF INCOMES.

["What income have we not had from a flower, and how unfailing are the dividends from the seasons."—JAMES RUSSELL LOWELL.]

The tax on my income is due—
Each year it is harder to pay!
For the whole cost of living's askew,
And of hope there is hardly a ray;
Yet though my purse shrinks in dismay,
My heart's bank account gayly grows,
For where are the taxes, I pray,
On the dividends paid by a rose?

The government's trying to screw
Every cent from our pockets, they say;
While strikers and profiteers, too,
Mix in in the general mêlée;
Yet few of these menaces sway

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Or threaten my secret repose,
For in a fair palace I stay
On the dividends paid by a rose.

There's given to me and to you
A heritage that can defray
All the burdens of life, and make new
The soul in its garment of clay;
The sweet seasons never betray,
Their bountiful banks never close,
And we can feel solvent for aye
On the dividends paid by a rose!

ENVOY

Friends, gold can be taken away!
But safe from the robbers are those
Who'll have entrance to Heaven some day
On the dividends paid by a rose!

—ANNE LLOYD, *Tribune.*

METHODS OF APPLYING LIME.

Contrary to common belief, lime and soil do not selfmix to any large extent, nor does lime penetrate to the deeper zones of ordinary soils. On upland soils, such as clays, silts, and the finer loams, all of which are compact, the chance for the descent of lime is small and the benefits to subsoil therefrom are of negligible practical value. Relative to this point, it may be said that applications of lime have been found to exert no perceptible influence in reducing subsoil acidity. In loose, open sands, however, a considerable quantity will be car-

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THE AMERICAN BOTANIST
Joliet, Ill.

ried downward by means of mechanical washing and by solution.

Two general methods of liming soils are in use; namely, by *incorporation* and by *top-dressing*. The former is preferable where feasible.

Since lime is unable to distribute itself effectively through the soil by natural processes, it becomes at once evident that this must be accomplished artificially by proper application. To be ideally placed for maximum effectiveness, lime needs to be distributed throughout the main root zone. What, then, are the requisites that constitute good liming practice? They are the following:

Even Spreading.—The aim should be to give every square foot of soil the same quantity of lime. If some spots receive an overdose, it is at the expense of others. In the one case the lime is not used efficiently and in the other there is neglect. Lime piled in heaps and scattered by means of a shovel results in a spotted effect and consequently less benefit per pound of material. The use of a fertilizer distributor or preferably a lime spreader will generally insure better distribution and should be employed.

Uniform Incorporation and Proper Depth.—Incorporate lime with the soil uniformly and to as great a depth as is practical. Good practice prescribes a depth of three to five inches. The quickest response and the fullest measure of benefits are realized when the lime is distributed throughout the major part of the root zone. This constitutes the ideal; anything less falls short of attaining the full object sought. The above cardinal principle should be adhered to as the keynote of efficient liming.

Mixing Immediately with Soil.—Mix the lime with the soil immediately with a disc or spike-tooth harrow before rain puddles it.

Applying at Plow-time.—The logical time to use lime is after plowing and before seeding. Several reasons are involved: (a) Generally the need for lime is vital at this time as it is common practice to utilize manures and crop residues then. By the decay of organic materials, available plant food is created. In the absence of bases, such as lime, soil acids exist which depress bacterial activity with consequent curtailment in the nitrate supply for crop use. Unless lime is provided to correct the unfavorable condition the crop suffers. Here the use of lime is timely. (b) In the case of an intertilled crop, such as corn, the subsequent cultivations aid in perfecting the incorporation of the lime and thereby augment its effectiveness. (c) Furthermore, adding lime at plow-time is *opportune* as it comes just at the point in the rotation to nicely pave the way for clover crop following. Especially is this true with corn, wheat, and oats, to be put to clover. In this way, action is well started by the time the sensitive crop is seeded.

Lime and Manure Usually Not to Be Mixed.—As a general policy it is not advisable to place lime and manure in direct contact before or after application. If the two are hauled as one load and spread simultaneously, however, the spreading should be done promptly. To finish the job properly, work immediately into the soil. Such a procedure is more permissible in the case of carbonate forms, which are slow acting, and on soils in acute need of lime. On the average soil, however, the proper practice consists of plowing under organic matter alone so it will rest in the lower portion of the furrow-slice, while the lime is well distributed above. Isolation is more necessary on open sandy soils than with opposite types.

Mixing Lime with Commercial Fertilizer.—Lime added to commercial fertilizers,

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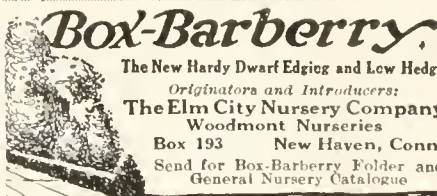
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before reaching the soil, may have one or all of several bad effects: (a) The usual practice in the past has been to advise against mixing of lime directly with nitrogenous fertilizer materials, such as ammonium sulphate, bone, tankage, dried blood, and similar materials, for the reason that ammonia nitrogen would be released and wasted. (b) The formation of a hard, lumpy physical condition in goods containing sodium nitrate or calcium nitrate is likely to take place. These objections are not so serious as they would appear. At any rate, there can be no danger when lime and fertilizers are added to the soil, separately, especially if a few days elapse between the liming and fertilization.

The use of lime as a top dressing is often the only recourse on permanent pasture or grasses, owing to the physical character of the soil, which prohibits plowing and working-in in the usual manner. While it is obvious that top-dressing does not afford the fullest efficiency, the effect can be heightened somewhat: (a) by applying the lime in the *Winter* or *early Spring* and thus taking advantage of the natural processes of freezing, thawing, and settling to imbed at least a portion of the lime in the immediate surface; (b) by *working-in* lightly with a harrow if applied in *early Spring* or *late Fall*. The latter procedure is applicable to alfalfa and grass lands as well as to permanent pastures. If the soil is sandy, the penetration of the lime will be more pronounced and the results approach those secured by actual incorporation. Very good results have often come from surface applications of lime.

In any event, the all-important thing is to get lime on the land; the benefits will come.

THE WILD GARDEN

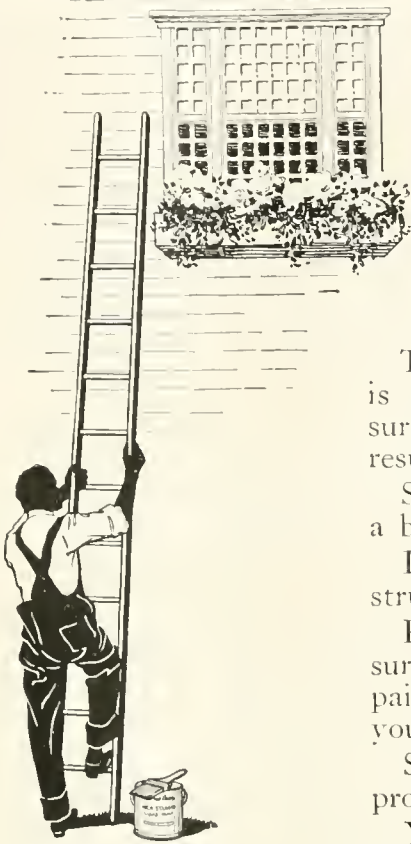
Any place which has a piece of woodland included in its area, or even a rough piece of boggy uncultivated ground, presents an opportunity for a style of gardening which many people would find very satisfying and restful. Fifty years ago Wm. Robinson, a noted English gardener and author, wrote his book, "The Wild Garden," in which he earnestly set forth the possibilities and pleasures of the naturalization of both native and exotic hardy plants. Since then the wild garden has become quite a familiar feature in British gardening and seems to be fully as pleasing as the stereotyped bedding system so much in vogue when "The Wild Garden" was written. There is a peculiar beauty and charm possessed by many of the native plants but which shows out to good advantage only when grown under conditions approximating their native haunts. What is there more pleasing in the opening days of Spring than a broad drift of Bloodroot or the little

Hepatica, or what more lovely than a big colony of the giant white *Trillium*? Violets and Wood Anemones, Columbine and Virginian Blue Bells, Marsh Marigold and Forget-me-not come readily to mind as beautiful features in the Spring picture, while at the other end of the flowering season we recall masses of Asters, Golden Rod and Joe Pye weed just as effective and beautiful in their natural setting as the finest well tended border plants of the garden. Then there are lovely Ferns suitable for almost any situation, some for open sunny places, others for shade, some which flourish in dry ground as

well as those which like much moisture. There is really a much greater variety amongst the native Ferns than might at first thought be supposed, some forty kinds being listed by one New England Nurseryman. A strong point in favor of developing this kind of flower gardening, wherever conditions will allow, is that all the subjects are quite hardy and the labor and expense involved is not great. There is every reason to suppose that we shall see increasing interest taken in this very satisfying phase of gardening.

Gardeners' Chronicle (English).

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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

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No. 10

Things and Thoughts of the Garden

MONTAGUE FREE

SOMETIME ago Mr. H. E. Downer, writing on this page under the *nom de plume* "The Onlooker," cited *Nymphaea* "Mrs. Woodrow Wilson" as being somewhat of a record breaker as a continuous bloomer. The exuberant growth of other tropical water lilies under observation raises the question if the palm for rapidity of growth must not also be awarded to some of the aquatic plants. The ability of the Royal Water Lily *Victoria regia* along these lines is prodigious, but it is capricious when grown outdoors in our New York climate, and conditions have to be just right in order to produce the phenomenal growth of which it is capable. Quoting from the Standard Cyclopedia of Horticulture we learn that—"Not the least remarkable feature of these leaves (referring to *Victoria regia*) is their rate of growth. Caspary found the maximum growth in length to be about 1 inch an hour when the leaf is just expanding; the surface increases 4 or 5 square feet in twenty-four hours and a plant will produce in twenty-one to twenty-five weeks 600 or 700 square feet of leaf surface." It must be admitted that is growing some! The season this year of cloudy skies, copious rain, and low temperatures has been unfavorable to the *Victoria* and miserable growth has been made. Some of the hybrid tropical water lilies, however, have done fairly well. The strongest grower in our collection is one received as "Wm. Becker" (which, however, according to Mr. Becker, is wrongly named). This was planted on June 18th, having at that time two or three leaves about 5 inches in diameter. By the end of August it had spread over an area of water surface about 50 feet in circumference and its leaves were two feet in diameter. Another variety, "Mrs. C. W. Ward," is a close second.

In passing it may not be out of place to remark that, although not so strong a grower, one of the best of the tropical night-blooming *Nymphaeas* is *N. Sturtevantii* which has beautiful coppery leaves and red flowers which may attain a diameter of 12 inches. Tricker states that it requires liberal treatment and a hot Summer to bring it to perfection. The new, tender, day-blooming *Nymphaea* "Mrs. Edwards Whittaker," raised by G. H. Pring of the Missouri Botanical Garden and awarded the gold medal of the N. A. G., is one destined to take a foremost place in the ranks of the water lilies. It is a truly wonderfully lily, which produces quantities of fragrant blue flowers twelve to fourteen inches across. In spite of the large size of plant and bloom of the tropical water lilies there are many people who prefer the hardy kinds. There is a charm about the latter which seems

to be absent from their giant relatives. They have a greater purity of color in the flowers, a more pleasing form and are, in general, more graceful in appearance. For small ponds or tubs they are much to be preferred.

Reverting again to rapidity of growth amongst aquatic plants, the "Floating Heart" *Limnanthemum nymphaoides*, although individual plants are small, spreads so rapidly by means of runners and seeds that it is inadvisable to plant it in a pond with other plants unless one has facilities for keeping it under control. A still smaller plant, the diminutive "Floating Fern," *Azolla caroliniana*, continually excites wonder by its power of multiplication; a few pieces introduced into a small pond early in the year will usually manage to grow at such a rate that the pond is covered by the end of the season.

* * * *

Amongst land plants some of the gigantic Bamboos are probably paramount as rapid growers. The young growths, looking like enormous asparagus tips, shoot up at an almost incredible rate once they appear above ground. It used to be said, with how much truth I am not prepared to say, that the Chinese made use of this rapid growth as a means of torturing their prisoners by tying the victim over one of these shoots and allowing it to grow through him! There is less reprehensible use for young bamboo sprouts as they provide an important comestible and are a prominent ingredient in the delectable "Chop Suey" and other similar messes.

Para rubber trees, *Hevea brasiliensis*, are said to make a growth of thirty feet in a season and I have had under observation a plant of the Ceara Rubber, *Manihot Glaziovii*, that, under greenhouse conditions, made a growth of 20 feet in about six months. Both of these plants belong to the family *Euphorbiaceae*. A species related to the Ceara Rubber provides the tapioca of commerce—which may explain the rubbery nature of some tapioca puddings!

It is oftentimes important that we should be familiar with some of these rapid growing plants when immediate temporary effects are desired in the garden. Then our thoughts turn, not so much to those that have just been mentioned, but to Castor Beans, Hemp, and other rampant annuals; such trees as the gawky Carolina poplar and its spirelike relative the Lombardy Poplar; and to the Kudzu vine, the ornamental gourds and others of a similar nature.

When visiting nurseries and private gardens this year I have been impressed with the fact that many of them have degenerated from the former high standards main-

tained. Places which were noted for their spick and span appearance, in some cases now present a weedy, unkempt appearance which is depressing to those who have the welfare of horticulture at heart. The shortage of help, both of trained gardeners and unskilled laborers, is in most cases responsible for this condition of affairs. Here is a situation where the National Association of Gardeners is in a position to render a great service to horticulture by its endeavors to interest young men in gardening as a profession and by opening up means whereby they may obtain suitable training. Bound up with this problem of interesting young men, who should be of the highest calibre in our craft, is the one of ensuring adequate remuneration and tolerable working conditions—in other words the carrying out of the objects of the Association—"To uplift the profession of gardening." It is useless to get men started in as gardeners if the inducements are insufficient to keep them there.

* * * *

It is only with a sufficiency of trained help that "fine gardening" can be accomplished. It is the attention to small details, that have to be "scamped" when labor is short, that makes the difference between excellence and mediocrity in gardening. But many of us this year have almost been in the position of having to choose between having our plants killed by insects or choked by weeds. There are some, no doubt (not many amongst professional gardeners) who will affect to be pleased at the turn affairs have taken. I refer to those who find more pleasure and interest in a garden that is allowed to run more or less wild than in one where meticulous tidiness prevails. There is, of course, something to be said in favor of the feeling of freedom and informality promoted by the garden which does not show too plainly the marks of the rake, and broom, and shears, but the more formal type of garden is a hideous failure unless maintained in a carefully groomed condition.

* * * *

In connection with this subject some remarks of W. H. Hudson, the famous naturalist and writer, can appropriately be quoted. In "The Book of a Naturalist," in the chapter headed "Concerning Lawns," he says: "I am not a lover of lawns; on the contrary I regard them, next to gardens, as the least interesting adjuncts of the country house. Grass, albeit the commonest, is yet one of the most beautiful things in Nature when allowed to grow as Nature intended, or when not too carefully trimmed and brushed. Rather would I see daisies in their thousands, ground ivy, hawkweed, and even the hated plantain with tall stems, and dandelions with splendid flowers and fairy down, than the too-well-tended lawn grass." After mentioning that "a fine country house or mansion * * * looks best on a level green expanse" he goes on to say: "Now I think that this grass setting would be just as effective or more effective if left more in its natural state. Seen closely, the smooth lawn is a weariness to the eye, like all smooth monotonous surfaces. * * * An acre or so of green linoleum or drugget, drawn evenly and smoothly over the ground surrounding a large house would probably have as good an effect as a perfectly smooth grass lawn." The disapprobation of Mr. Hudson need not cause us any great perturbation—the whole question is largely one of the point of view—Mr. Hudson's being that of the naturalist. There are many who sympathize, in part, with Mr. Hudson's views and it might be salutary for some of our garden makers to take note of them.

We have landscape architects who appear to look on plants in the same way that an artist views his pigments—as something with which to make a picture. They fail

to take cognizance of the fact that plants have beauty of form as well as coloring, that many are fragrant, and that some are interesting because of adaptations to their environment. There are landscape architects who maintain that a great variety in landscape material is not desirable and seem to have little appreciation or love for plants for their own sake. A garden in which these ideals prevail, and where everything is subordinated to the garden picture is likely to be deadly dull in the eyes of the naturalist and plant lover. Let it not be inferred that I am decrying the work of the landscape architect; this is only a plea that they will not get too much into the habit of looking on plants as "pigments," or we may find ourselves back in the Victorian period when colored bricks and sand were used instead of flowers!

* * *

Young gardeners, and old gardeners too, for that matter, have splendid opportunities nowadays for increasing their horticultural knowledge by reading, even though circumstances may deny them access to a public library. There are many periodicals to be obtained at a trifling cost which cater to the needs of those thirsting for information on gardening matters. In some cases, it is true, the information given needs judicious sifting, but generally the high class periodicals are to be relied on. Then there is the vast amount of literature appertaining to plant culture put out by State College of Agriculture, Experiment Stations, and the U. S. Department of Agriculture—free to those who ask for it.

Looking over a list of Farmers' Bulletins issued by the Department of Agriculture one is impressed with the fact that there is offered the nucleus of a fine garden library. Interspersed with such titles as "Rabies or Hydrophobia," "Hog Cholera," "School Lunches" and "Breeds of Dairy Cattle" one finds scores of bulletins on subjects of direct interest to gardeners. These range from "Propagation of Plants" and "Pruning" to the "Cultivation of Mushrooms" and "Fumigation of Ornamental Greenhouse Plants with Hydrocyanic-Acid Gas." There are many bulletins on the significance of birds in agriculture and horticulture, detailed discussions on insect pests of plants and even one entitled "The Bedbug." The latter probably does not concern present day gardeners very seriously but I imagine some of the old-timers have had experience of living conditions in "bothies" where such a leaflet would have been welcome!

In times past much criticism was leveled at the issuance of these Bulletins on the score of waste of time and paper in their preparation. It used to be said that their ultimate destination was the wastepaper basket—unread. But modern farmers and gardeners are losing their prejudice against "book knowledge." One reason, no doubt, why many failed to take advantage of information contained in publications of this kind was their heavy, stogy appearance. Latterly, however, endeavors have apparently been made to make them more attractive. Many of the later issues of the "Farmers' Bulletins," for instance, have blossomed forth in interesting looking pictorial covers.

At first when one regards the vast amount of horticultural literature that exists today one wonders how it is possible for anything fresh to be written on the subject of gardening. Yet, take the example of the *English Gardeners' Chronicle* which has appeared weekly since 1841 and far from being stale, it is still fresh and interesting to garden enthusiasts all over the English-speaking world. But we must remember what a great and intricate subject horticulture is, with many ramifications interlocked with other branches of art and science—for horticulture in its larger meaning is both an art and a

(Continued on page 343)

Viburnums

ARBORUM AMATOR

OF the nearly one hundred species of *Viburnum* which are widely distributed through North and Central America, Eastern Asia, Northern Africa and Europe, some growing in shrub and others in tree form, about a score are well worthy of cultivation.

The genus *Viburnum*, which belongs to the botanical order *Caprifoliacea*, has opposite leaves, flat compound cymes of small flowers, mostly white, and bears sometimes blue but mostly purple or red, one-seeded, soft, pulpy drupes containing a flattened and thinly crustaceous stone.

The hardiness of *Viburnums*, their compact form, their handsome foliage, their showy flowers, and decorative fruit, and their adaptability to different situations, soils and uses all commend them to the lover of ornamental flowering shrubs.

Viburnum tomentosum is indigenous to Japan and China. Of a spreading form, and attaining a height of about eight feet, it is a handsome shrub either in foliage, flower or fruit. In June its cymes of white blooms appear, and these are followed by its fruit, at first red, but changing later to a blue-black.

Viburnum plicatum is the well known Japanese Snowball, one of the finest of all *Viburnums*, considered by some a variety of *tomentosum*. Its globose heads of sterile flowers, about three inches in breadth, are showier and denser, and last longer on the bush than those of the common Snowball. The brown shoots of this species are well furnished with a dark green foliage, and are, like the branches of an oak, nearly at right angles to the body. This species is of compact form of growth, and is of about the same height as *tomentosum*. There is a variety of this called *rotundifolium* which blooms about ten days earlier.

Viburnum opulus, often called high cranberry, is indigenous to Asia, Europe and North America. This species varies in height from five to ten feet. Its white cymes, the marginal flowers of which are radiant, are about four inches broad, and appear in May and June, and are followed by oval red fruits, which, as the birds do not eat them, remain on the bush till the next Spring. These fruits, having a pleasant acid taste and resembling cranberries somewhat, are sometimes used in place of them. In Autumn its foliage assumes very bright shades of color. *Sterile*, a variety of *opulus*, is the old favorite Guelder-Rose or American Snowball. Though its blooms and foliage make this variety a showy shrub, it lacks the red fruit of the species *opulus*. There are furthermore some forms of *opulus* with variegated leaves and a very dwarf variety *nanum*, the smallest of the genus, growing no more than one to two feet high and seldom flowering.

Viburnum lantana grows to a height of twenty feet. This is sometimes called in England the Rowan tree, but more commonly the Wayfaring tree. It is often planted close to the side of houses and other buildings, because it is supposed to be a sure protection against witches, sprites and goblins. This species has an upright form. In May or June its cymes, two or three inches broad, of white flowers, appear. These are followed by ovoid-oblong fruits, at first red, but turning later to nearly black. The fruit is very sweet, and remains long on the stem, and both it and the acrid inner bark are medicinal.

Viburnum lantanoides, the American species, is different from *lantana* in having the form of a low bush or shrub. It is indigenous to rocky, moist, dark woods from

New Brunswick to New England, and as far south as North Carolina. It is usually found in desolate, wild places, and its broad heads of white flowers, which are followed by crimson fruit, turning at maturity to black, are in beautiful contrast with their surroundings.

Viburnum macrocephalum comes to us from China. This has a spreading habit and reaches a height of ten to twelve feet. It produces in May and June cymes three to five inches across of yellowish white flowers, the marginal flowers being sterile and radiant. There is a variety of this called *sterile*. This is rarely seen, though not new, and is known as the Chinese snowball. Its blooms are in nearly globose heads, seven to eight inches across. *Sterile* is the largest flowering of the *Viburnums*. It is reputed to be hardy in New England.

Viburnum lentago is a hardy native species, found from the Atlantic Coast to Missouri and Minnesota, and northwards. It forms a bush or small tree having slender branches and attaining a height of fifteen to thirty feet. In May or June its yellowish white flowers appear in cymes three to five inches broad, and these are followed by bluish-black oval fruits, which remain on the branches till the following Spring, hence the common name of this species, Nannyberry, Sheepberry.

Viburnum acerifolium is a native shrub, found in New Brunswick to Minnesota, and southward to North Carolina. It grows in shaded situations always, and is an excellent shrub for planting in such locations. Its flowers are of a pale purple color at their opening, but later become white and are followed by nearly black fruits. The foliage has the shape of that of the maple, hence its specific name *acerifolium*, maple-leaved.

Viburnum dentatum reaches a height of about ten feet. In May or June its cymes of large showy white flowers appear and are succeeded by purple fruits. This handsome native shrub, which is found from New Brunswick to Maine, and southward as far as Georgia, is commonly called arrowwood, because from its tough, heavy, hard-wood shoots the Indians used to make arrows.

Viburnum dilatatum, by reason of its scarlet fruits, which remain long on the branches, is a highly decorative shrub in Autumn. Its flowers are pure white and are arranged in cymes three to six inches broad, which appear in May and June. This species, which comes from Japan and China, has an upright and bushy form. It attains a height of ten feet, is hardy and free flowering, and is commonly known as the Japanese bush cranberry.

Viburnum molle has an attractive foliage, is more robust than *dentatum*, and blooms about two weeks later. Its native habitat is along the coast of New England from Massachusetts southward to Florida and Texas. *Viburnum pubescens*, native from lower Canada to the Georgia mountains, and west to Iowa and Minnesota, is a straggling low shrub, much inferior to *dentatum*. This is commonly called downy arrowwood.

The pretty evergreen species *Viburnum tinus*, *Japonicum rugosum* and *lucidum* are not hardy in the North.

Viburnum cassinoides, commonly called Appalachian tea and white rod, is native from New Foundland to Manitoba, and Minnesota to North Carolina. Fruits at first pink, but later dark blue follow its yellowish-white pink flowers. The foliage of this hardy species assumes beautiful hues in Autumn.

(Continued on page 343)

Preparing the Bees for Winter

H. W. SANDERS

WE come now to a time of year in the apiary when the bees are preparing for their long Winter rest. They do not sleep, or hibernate, after the manner of flies and other insects which lose all semblance of life during cold weather and revive again when Spring returns, but retain their activity all through the Winter, and even when their repose is deepest the slightest jar or tap on the hive, or the effect of a rise or fall in temperature is felt by the bees and the experienced beekeeper can tell by carefully listening to the gentle buzz that comes from the hives whether the bees are comfortable or not.

The exact means by which the bees keep up the heat inside the cluster is not fully understood. They are not warm blooded animals, yet a thermometer pushed into the centre of the dense cluster that is formed during cold weather will register not very far from the level of the human body—in other words blood-heat. We know that they do this by the consumption of honey, in itself a very concentrated food-fuel, but just how they turn their muscular energy into heat is obscure. The most that science can tell us is that there are bees inside the cluster busily "fanning" with their wings as they do during a hot day at the entrance to the hive, and this is the sound that the beekeeper knows so well.

In the preparations for Winter the most important thing is to see that there is an abundance of food, for the use of heat production as above outlined. In the case of most of the animals that are kept by man, the exact nature of the food is capable of considerable variation, and it is better for the animal if a varied diet is given. With bees, however, the sole function of the food provided is to produce heat, and therefore it is of the utmost importance that the food should be a heat-producer (carbo-hydrate), of the utmost purity. Nature has provided this in honey, and if it is necessary to supplement what the bees have provided the only thing that will take its place is syrup made from the best granulated sugar. In fact, where the honey gathered is of such a nature as to granulate rapidly sugar syrup is far better. One of the photos shows a comb filled with candied, or granulated honey that was gathered from certain flowers that bloom in the Fall, chiefly Aster, and although there was plenty of this in the hive a colony starved to death through their inability to utilize it. The honey from the earlier flowers, such as Clover or Basswood is nearly always safe, and the practice of many of the best beekeepers is to leave combs filled with such honey in sufficient quantity as to ensure the food being abundant. In order to be sure of this we always weigh our hives and if one scales less than 65 pounds for a ten-frame Langstroth, we feed enough sugar to bring it to that figure. For an eight-frame hive the amount is 55 pounds.

To feed for Winter, take granulated sugar two parts and water one part and dissolve, heating the water before putting the sugar in it. Feed by taking a ten-pound honey pail and puncturing a number of holes in the lid with a nail. Fill this with syrup and turn it upside down inside a super directly over the combs in the hive. Cover to keep the hive warm and robber-bees out.

In order to conserve the warmth of the bees on the chilly fall nights, the hives may well be covered with

tar paper. A piece is laid over the cloths after the cover has been removed, and folded down like a parcel, then secured with a slat and nail and the cover replaced.

There are two ways of wintering bees, in the cellar, and outdoors, and it depends a great deal on the latitude as to which is the better. In the Northern States and Canada, where Winter is long and severe, the cellar is the safest place, but further south, where days occur during the Winter on which the bees can fly, they may be packed and left on their summer stands. Bees can only void their excrement while on the wing, and during these "cleansing flights" they can relieve themselves and then form again the cluster in another part of the hive, until the next opportunity for a flight occurs. In the far north it is very unusual for the temperature to be good enough for a flight from November until March, and the best way to avoid the necessity for one is to keep the bees in a dry cellar where the temperature varies little if at all—under just such conditions as furnish the ideal location for the storage of potatoes and other vegetables. It may be the house cellar, or it may be an outside root-house, but whichever it is the requirements are that it be dry and of an even temperature of from 40 to 45 degrees with an adequate amount of ventilation. The bees should be carried into it as soon as possible after they have had their last flight in the Fall—in this locality we aim to get them in during the first ten days of November.

In case there are any weak colonies they are best united one with another. To do this take a newspaper, and lay a single thickness over one of the colonies, after removing the cover and cloth, and then place the other colony immediately on the top. The bees will in due time eat their way through the paper and unite their forces, and it is far better thus to gain a thoroughly strong colony to face Winter than to attempt to carry over two weak ones. At the present high prices of honey it is foolish to waste it by letting a weak colony have winter stores, for they will most likely eat most of it up and then die out, and both bees and honey will thus be lost.

Where bees are packed and left outdoors all Winter, they should be protected by several inches of sawdust or chaff inside a case that is watertight, and they should have a passage through it to the hive entrance so that they can get out to fly on a mild day. The yard should be protected by a fence high enough to break the force of the wind, or by trees, so that the snow will bank around the hives and protect them. As the days grow colder, brood-raising will gradually cease, drones will be driven out to die, and the bees closely clustered upon their combs of honey will await the coming of Spring.

The people who make mistakes lead the world. The perfect people work for them, running errands and counting columns of figures. The genius is not the man who never made mistakes, who had a chance thrust on him, who was endowed and all that; he is the man who had no chance and was not gifted, but who took the raw material of life and fate as he found it, and made something fine out of it. The only perfect person you will ever meet is the perfect fool.—*Safety Hints.*

Hedges and Their Upkeep

THE question of hedges is one of far-reaching importance, for it claims the consideration of the proprietors of large and small estates, farms, gardens, parks and woodlands throughout the length and breadth of the country and must be considered from many points of view. Hedges have three main objects—they ensure privacy, protect crops and stock from the encroachment of animals and damage by wind, and are effective lines of demarcation. The two former are, perhaps, the more important—for purely dividing lines can, if desired, be more conveniently made by other means and with greater economy of land. Nevertheless, living hedges are often preferable as lines of demarcation to either wire fences, post and rail fences, or walls.

It often happens that a hedge is required to serve the three objects at the same time, and in such a case it must be high enough and dense enough to obstruct the vision of the tallest person and break the force of wind; formidable enough to resist the pressure of strong animals and, at the same time, form an effective dividing line without encroaching too much upon the land on either side. For inner dividing lines, however, such as are used for separating one part of a garden from another, strength and height are of secondary importance, and there are many shrubs of moderate growth that are infinitely better for the purpose than the plants that are selected for more exacting positions.

A living hedge is often more appropriate and pleasing than a wall or iron fence, while it is infinitely cheaper in the first place although it may require more constant attention in the way of upkeep. On very exposed land it is often expedient to use stone walls for surrounding gardens and fields, especially where stone can be quarried near by. In bleak places even the hardiest of hedge plants are difficult to establish, therefore walls, built with or without mortar, are substituted. Such walls are often seen in the Peak District, the Lake District, Scotland and elsewhere. But in ordinary positions there need be little trouble in establishing really good hedges.

In some parts of the country a modification of wall and hedge is adopted. Banks several feet high composed of stone and earth are built, and on the top a hedge is planted. Readers familiar with Devonshire and Cornwall must have noted many such combinations.

For general purposes of protection and privacy hedge plants must be long lived, dense in habit, spiny for preference, not fastidious as to soil, and be capable of withstanding close clipping for many years without injury. The plants suitable for such hedges are limited to comparatively few species, but for inside hedges, for more or less ornamental work, there is a very wide choice of subjects. They rarely require severe pruning and, in fact, are more beautiful when allowed considerable freedom.

The preparation of the position for a hedge is of considerable importance, and greater care should be taken than has been the case in the past, more particularly on farm land, in arranging the dividing line in such a way that the least possible waste of land will be brought about and also that the hedge will not endanger the development of crops in the vicinity. The dividing lines between fields on the same farm are often very irregular in outline, tending to waste of ground and difficult working of headlands. When planting new hedges such irregularities should be removed and the line straightened. If a curve is necessary, let it be a distinct one, and have done with it, instead of numerous little wiggles. Then the open ditch, often left at the foot of a hedge, should

have consideration. In the past it was usual to open a ditch at the foot of one side of a proposed hedge, placing the soil so obtained on one margin to form a bank, and then planting the hedge on the bank. On very wet land this system had advantages, for the field could be conveniently drained into the ditch. But such ditches waste a good deal of land and, if well kept, entail a lot of work, or if neglected fail to answer their purpose. It is infinitely better to drain the land into a closed drain, carrying the water to a proper outlet wherever possible. In fact, in some agricultural districts farmers are filling in and dispensing with many of these old banks and ditches. A ditch at the foot of a hedge has advantages on dairy land, for it assists in keeping cattle within bounds. Hedges that are allowed to become overgrown prevent the development of crops near by, because they obstruct light and air, and on hay and corn land prevent quick drying.

The actual preparation of ground for hedges should consist of working a strip of ground 3 feet wide to a depth of 2 feet, breaking up hard subsoil draining when necessary, and the substitution of poor soil with better. The surface soil must be kept to the surface in every case as that from a considerable depth, say, below 12 inches or 15 inches, is usually sterile and plants placed in it have difficulty in forming new roots. The substitution of good soil for that of inferior quality is preferable to adding a considerable quantity of manure. But when manure is added it should be so placed that it cannot come in contact with injured roots. Ground preparation should be completed several weeks before the hedge is to be planted in order that there may be no after sinkage of soil.

With the exception of a few subjects, such as common Holly or Evergreen Oak, planting may be undertaken at almost any time during open weather when the soil is dry enough, between early October and the middle of March. There are, however, a few evergreens—of which those mentioned are examples—that give better results if planted in May or September. When the soil is heavy or of a clayey nature hedges should not be planted while it is very wet.

There is no settled size for hedge plants at the time of planting, and examples 10 feet high are sometimes used. It is, however, unwise to select large plants, and, as a rule, it is advisable to limit the height of such plants as Yews and Hollies to 4 feet at planting time, whereas such plants as Thorns and Privets are large enough at 2 feet. Plants of small or moderate size are usually much more satisfactory in the end than large ones, especially when they are planted in exposed places. It is very important, however, that plants selected for hedges, such as Yews and Hollies, should be well furnished with branches to the ground, for plants that are bare at the bottom are very difficult to improve when once planted as a hedge. Thorns and Privets can be cut hard back after twelve months in the ground, if necessary; in fact, Hawthorn usually forms a better hedge when cut down to within 6 inches of the ground after it has become well established, than when allowed to grow unchecked. When a hedge can be started with a dense and uniform bottom, a great deal of future work is avoided. When gaps occur they should either be filled by planting small plants in the gaps, or by pegging branches down. When selecting Yews for a hedge it is advisable to choose those with several stems springing from the ground rather than planting with single trunks or stems.

The best hedges are produced by keeping the bottom on each side free from weeds and by ruthlessly excluding such wildings as Dog Roses, Honeysuckle, Virgin Bower, Brambles and the like. These, though beautiful in their proper place and a source of pleasure to the artistic mind when clambering over hedges, very soon ruin what would otherwise have been excellent hedges.

It is always a mistake to allow a hedge to increase in height too rapidly, height growth should depend entirely upon density and condition of the lower parts. First get a good bottom and then pay particular attention to maintaining it, and the top will look after itself. Weak bottoms to old hedges may sometimes be improved by lowering the tops and by cutting the sides well back. Whenever such severe pruning is necessary it should be done in Spring, March or April, for at that time new growth is soon formed. For ordinary clipping there is no proper time, and it can be done to suit the individual. Privet has to be clipped several times during the growing period, but subjects that only need this treatment once a year are usually clipped at the end of the growing season, or on some farms are left until Winter.

On farm land hedges are sometimes allowed to grow very large and become very rough in order to provide shelter for stock. Then, after a while, for some purpose or other, they have to be brought under control. This can be done by removing some of the branches, and partly cutting others through so that they can be laid down in the proper direction and secured to stout stakes driven into the line of the hedge. The rough sides are then trimmed back until a narrow hedge 1 foot or so wide and 4 feet or 5 feet high is formed. The work is done in Winter and as the branches are only partly cut through communication is maintained between branches and roots, and growth is ensured the following Spring. Hedges treated in this way form exceedingly strong fences in the course of a couple of years.

The distance apart to place the plants in a hedge must be determined by the size of the plants, but it is not wise to place them more than 2 feet apart, and Thorns are better planted at about 12 inches, in fact, the more strong, erect stems there are the stronger is the hedge likely to be. When Conifers, such as *Thuja gigantea* or *Cupressus Lawsoniana* is used, the plants may be spaced a little wider apart if desired.

SELECTION OF PLANTS.

Hawthorn Quick, Quickset or Whitethorn.—This is the most generally useful subject for hedges in the British Isles. It is perfectly hardy, thrives in light and heavy soils, lasts in good condition for many years, and provides excellent shelter. Its thorny branches make it peculiarly suitable for fields. If not cut regularly once a year it is liable to grow too freely about the upper parts and the bottom may become gappy.

Common Holly (*Ilex aquifolium*).—There is no better evergreen for hedges than this. It succeeds throughout the greater part of the country, grows well in a variety of soils, forms a high and strong hedge and may be expected to last 100 years, while its spiny leaves and dense habit make it stock-proof. If clipped once a year it may be kept in good condition.

Yew (*Taxus baccata*).—This is another excellent evergreen for hedges, but inferior to Holly by reason of its spineless leaves, poisonous character, and more gloomy appearance. Nevertheless, it forms an impenetrable fence 10 feet to 15 feet high, stands clipping well, and may

be expected to last in good condition for at least a century. Although it grows well throughout the country, particularly in chalky soil, it is impatient of very wet ground, and water standing about the roots may have disastrous results.

Box (*Buxus sempervirens*).—The Box might be used more frequently than at present for its leaves are a cheerful green, it stands clipping well and forms a strong and neat fence. It is not, however, adapted for shady places where it will be heavily overhung.

Laurel (*Prunus laurocerasus*).—This is used extensively in some places and forms a good hedge. It, however, impoverishes the ground in its vicinity and is not adapted for small gardens. Any clipping should be done with knife or secateurs, for shears injure the leaves and render them unsightly.

Escallonia macrantha is an excellent evergreen for a hedge in the milder maritime counties. Moreover, it produces a good display of red flowers during Summer. It succeeds near the sea and withstands strong sea breezes. The best hedges are from 4 feet to 6 feet high.

Myrabalan or Cherry Plum (*Prunus cerasifera*).—This is a deciduous Spring tree that can be used for hedges in the same way as the Hawthorn. It forms a moderately good hedge, but is decidedly inferior to Hawthorn for general purposes. It is not fastidious as to soil.

Holm Oak or Evergreen Oak (*Quercus ilex*).—For the warmer maritime counties and also for the Midlands this tree may be used successfully for hedges. It grows to a considerable height and becomes very dense if clipped once a year. It must, however, be given plenty of room, for it grows vigorously.

Common Beech (*Fagus sylvatica*).—There are many places where Beech can be used with success as a hedge plant. It is at its best as a wind-break when it can be allowed to grow 12 feet to 15 feet high and kept fairly narrow. The plants should be placed fairly close together, 12 inches to 18 inches apart. It gives excellent results on loamy soil, particularly on chalk.

Hornbeam (*Carpinus betulus*).—The same remarks are applicable to this as to the foregoing.

Lime (*Tilia vulgaris*).—This may also be used for hedges or screens. The branches should be cut back once a year. It succeeds in light or heavy loam, the former for preference.

Oval-leaved and Common Privet (*Ligustrum ovalifolium* and *L. vulgare*).—These two shrubs, particularly the former, are used very extensively for garden hedges on account of their adaptability and rapid growth. They are, however, hungry subjects and impoverish the ground in their vicinity. On this account the roots should be cut back annually. The common Privet is sometimes mixed with Hawthorn to form hedges.

Thuja gigantea, *T. occidentalis* and *Cupressus Lawsoniana* are sometimes planted to form high, informal hedges. It is a mistake to attempt to prune such things severely.

Berberis Darwinii and *B. stenophylla* form useful garden hedges where great strength is not required. They may be kept in condition by an annual clipping as soon as the flowers fade.

Informal Hedges may be formed of Roses, Lavender, Rosemary, species of *Veronica*, *Escallonia Phillipiana*, *Tamarix*, *Olearia Haastii*, *Hydrangea hortensis*, *Fuchsias* in the milder parts of the country, Tree Heath, *Rhododendron racemosum*, *Pernettya mucronata*, or almost any shrub of moderate growth. Regular pruning or clipping is not desirable, but a little trimming up now and then is beneficial.—*The Garden*.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

Fall Planting.—Fall planting has been of slow acceptance by the average home gardener, because he or she reasoned that it appeared foolish to do planting when all Nature was preparing for a period of rest. Spring seemed ever so much more seasonable when the sun began to make its influence felt, and it made one feel good to be digging, and delving in the soil. Then, while the young people's thoughts were turning to love, the gardener's were turning to the garden with visions of beautiful flowering plants, selected from pages of more or less bulky catalogs. Orders were hastily placed and the coming of the plants impatiently awaited, while in due time they were planted in their appointed places, to slowly recover. But, alas, the days pass with never a bloom, or only scanty ones at the best. Such is only too often the story of hasty spring planting. It is only a matter of time before fall planting will be accepted, by even the most skeptical, as the most reasonable, the most beneficial, and the most satisfactory, in its results for the majority of plants.

One doesn't have to give very serious consideration to the structure of plants to realize what a severe shock, and setback, it is to a plant to be dug up, shipped long distances, very often without necessary moisture, and then transplanted in a new situation. After recovery from such an experience the plant must immediately send forth its roots in search of nutriment, and begin the tremendous task of readjustment. Yet, withal, how many unconsciously would heap insult upon injury by expecting the plant to fill still another office, that of growing apace, and blossoming forth in all its glory the first season. This is what spring planting demands of the plant; its immediate recovery, and establishment, followed by profuse bloom, and rapid growth.

By planting in the Fall, however the plant has a much better chance. It is not checked just at a time when its growth is quickening, but is dug up when the work of the year is drawing to a close, and the plant system is preparing itself for the Winter. There is still enough heat in the ground to enable the plant to develop new roots, and it can adjust itself to its new surroundings before very cold weather sets in, and thus be prepared with the first rush of Spring to throw all its energy into new growth. There is no question of the superiority of fall planting; it gains the planter a whole season, as the bloom the Summer after planting will be abundant.

To be denied the joys of the first spring flowers is to miss half the joy of gardening, and this is another disadvantage that spring planting has. The late flowering plants are favored, while it is then too late for the earlier flowering varieties. Think of missing, for instance, the crocus, tulips and hyacinths, because we omitted to arrange for their coming the previous Autumn.

So it is with a host of other things: The moss pinks, with their sea of color; the deep blue of the violets, the beautiful *Mertensias*, the golden bells of the *Forsythia*, the striking blossoms of the Dogwood, and other early blooming things. Now is the last call; so plan at once for their reception, and before the ground is tied up permanently for the Winter by frost your Spring of delight will be practically assured.

Even if you have all preparations made in advance for fall planting, it may be impossible to do all the plant-

ing immediately. Unpack the plants at once, taking care to check them up with the copy of the order; wet the moss or burlap about the roots, and heel them in in a shady place.

Firm planting is essential, and doubly important in fall planting, because loose planting at this season not only delays the plant in getting established, but leaves it liable to swaying to and fro by the winds, and the action of alternate freezing and thawing, that it may die from winter killing, though hardy enough to stand the climate if properly planted.

A wooden tamper is very useful in setting out shrubs, and one can soon be made out of a piece of wood two inches or so in diameter.

Before setting out any of the trees or shrubs that have come from the nursery go carefully over the roots and cut back to sound tissue any that have become broken or bruised or are so long as to be unwieldy. Minute roots will start from around these fresh cut just the same as they do at the base of a cutting, so don't be afraid to use your knife. A reasonable trimming back of the top branches is also necessary, but in the case of early flowering shrubs, we do not recommend trimming back, but removing about one-third of the shoots, so as not to cut away all flowering stems. If the ground where the planting is being done is very dry, it will help matters a good deal to water before planting as well as after. Before setting the plant in the hole fill it half full of water, and after this has soaked away, set the plant, throw in soil under the hole until one-half or two-thirds full, then fill with water again. Fill in the soil well about the roots so that no dead air spaces are left, work it in with the fingers until you are satisfied that the soil is in contact with every root. When finished the plant should be in the soil just as firmly as if it had been growing there some time. Leave a loose dirt mulch on the surface to check evaporation of the moisture, and when the ground freezes up apply a mulch of well rotted manure over the whole area planted.

Vegetable Garden.—While a number of the hardier vegetables may be left out until it is quite late, yet one cannot afford to take too long chances, as very cold weather may come overnight, and they will be frozen before you are aware of it.

In this connection it might be well to have some protective material at hand in case of a killing frost to throw over the growing things yet in the garden. Wire or string run along the rows of string beans or Limas will keep the burlaps or other material from weighting down the plants. A few barrels placed near the egg plants and peppers are easily slipped over them at night. Salt hay makes excellent covering for lettuce, endive or celery not yet put into winter quarters. Spinach may also be covered with hay, as well as that which is to be carried through the Winter. Tomatoes on the trellis may be protected by using mats, burlaps or heavy paper, but a better plan is to gather all the fruit and place it in a light airy room where it will ripen perfectly.

All herbs may be gathered and stored for Winter; cut and tied in separate bunches, and hung from the ceiling in the attic until dry, when they may be powdered and put in boxes for everyday use.

It is not too late to put in a new bed of asparagus.

Protection will be needed during the Winter, but asparagus starts early in the Spring, and by planting in the Fall one gets advantage of an early start in the Spring.

As the crops are cleared away every available piece of ground should be sown down with rye; it not only makes a pleasant ground cover during the Winter, and prevents erosion, but is a valuable addition to the soil when ploughed in the Spring.

Onions and spinach may be sown for wintering over. If rhubarb is thin, and goes to seed rapidly, it needs resetting. Do it now in well manured soil.

Winter celery still grows rapidly, and will need attention in the way of blanching by hilling, or otherwise.

Lawns and Flower Gardens.—The lawns should be kept mowed right up to actual freezing; don't neglect this, or a straggling growth will be left which will prove troublesome in the Spring, inasmuch as it dies back, and makes the lawn unsightly.

Remember to shut off the water from all exposed pipes and drain them out, before they freeze up. Just as soon as the frost blackens the dahlias, cut off the tops, dig up the roots, and stre them in a dry cellar, in sand.

Cannas are handled in the same manner, but they may be stored without covering; under the greenhouse bench is a good place for them, though they may safely be stored in the cellar. All tender plants of a bulbous nature that cannot endure the rigors of Winter, such as Caladiums, Tritomas, Gladiolus, Tuberoses, Montbretias, had better be lifted and stored in the cellar. Extra fine Sweet Peas may be had by sowing the seeds now. Of course, protection is necessary, but they are worth the effort. Boards set on edge, with a top board over these, and the space between filled with dry leaves, and a good covering of salt hay or long manure over this will generally be sufficient during the severest weather.

Continue to plant bulbs as they arrive; also to reset perennials that have become crowded. Give the flower bed a thorough cleaning if you are not planning any changes in it. Cut down all dead flowering stems, and clean the spaces between the plants, leaving everything in readiness for the mulching when the time comes to put it on.

Bay Trees, Hydrangeas, Oleanders.—Other decorative plants of a like nature, should be placed where they can be protected overnight, now that frosts are inevitable. It is too early yet to put them into permanent quarters, as they will get soft, and not winter well.

Summer bulbous plants, such as *Achimenes*, Gloxinias, Begonias, Caladiums, etc., should now be fairly well dried off, so that the pots may be placed on their sides, under a bench in a cool greenhouse, free from drip.

Tender water lilies must be brought in from the ponds after the first killing frost and stored under the benches in the greenhouse, until time for starting them into active growth again next Spring. Tender aquatics that are not tuberous must be brought in before freezing weather, otherwise they will be destroyed.

Frames.—Do not leave the frames empty and neglected this Fall. Plants that have occupied them all Summer and which are intended for winter flowering had better be placed in the greenhouse. If put into service at once the frames can be used for blanching celery, ripening up tomatoes and melons, which are nearly mature, but not quite ripe, at the first killing frost, and developing partly grown cauliflower to a larger size. Get the frames as snug and tight as possible for the Winter by banking them nearly up to the top. All cracked and loose glass should be reset. Old sash may be made quite snug and tight by the use of liquid putty, which can be applied very rapidly with a putty bulb, or by a hand machine made for that purpose. Then place in the frames a good light

friable soil. It will pay to put this in now; even if you do not intend to grow anything in them this Fall, it will be ready for spring planting. Do not use heavy clay soil in the frames, as quick drainage is essential to success.

One of the most easily grown, and by far the most popular vegetable for the cold frames is lettuce. The two varieties that can be most strongly recommended for the amateur are Grand Rapids and Big Boston, both of which do well at a low temperature. About fifty plants can be put under each sash, but if this number is planted at one time they should be of different sizes. Try and locate the frames so that they can utilize some of the surplus heat from the cellar window, and make a sowing of lettuce every three weeks throughout the Winter. Radishes are easily grown, and Crimson Globe gives good satisfaction. It cannot be planted as closely as some of the other varieties, because its foliage is larger. Make the rows five or six inches apart, and sow the seed thin. Spinach is a low temperature crop, and in a frame where a mild temperature can be maintained, a crop of this vegetable may be had from what otherwise would be wasted space. Chicory may be lifted from the open ground, and planted to a frame, where it may be blanched by darkening the sash.

Pansies or other hardy biennials, started this Fall for next Summer's growth, can be developed into more sturdy plants by transplanting to a frame than if left in the open. They will continue to thrive long after those in the open, and will begin growth earlier in the Spring, and be in vigorous condition for transplanting. Yet another way of utilizing a spare frame is to pot up some good strawberry plants, and sink the pots half their depth in the soil. They will continue to grow for some time with the protection of the frame. When hard freezing arrives they may be protected with mulching, so that they will not freeze hard, and then in the Spring they may be stimulated into active growth by the aid of a mild hot bed.

Not infrequently it happens that in a batch of cauliflower plants from seeds sown at the same time, quite a number lag behind in maturing. With a deep frame available one can take up these late plants, which very often make fine heads, and save them from what would otherwise be a total loss. Set them as close as practical in the frame, wetting down the soil if at all dry. Keep them shaded, and the half-grown heads will increase considerably in size, and give some fine cauliflower out of season—something that will be doubly appreciated because of the scarcity of such plants then. Any frames that are not to be used now, if manured and fertilized, will be in the very best condition for spring planting, besides saving a good deal of time at that busy season.

Greenhouse.—In the greenhouse vegetables are being grown more and more, and the first crops of Lettuce and Cauliflower should now be ready for planting out into the benches. Beans and Cucumbers may also be sown in a warm house. The successful grower of vegetables under glass must be able to judge his own needs to have a continuous supply with a minimum of waste. No hard and fast rule can be laid down. The easiest and best insurance is to sow plenty of seeds always; the cost is small and the returns great. Sow often, and you will have on hand enough young plants to assure a continuous supply. It is well to tap the tomato plants as one passes them about the noon hour. This will usually be sufficient to cause them to set. In very dull dark weather it may be necessary to resort to hand pollination.

Now, that ventilation is reduced and fire heat again a necessity, a sharp lookout must be kept for insect pests. Chrysanthemums will be showing color early this month, and fumigation should be done thoroughly just before

the buds burst to insure them not being infested with black fly. Feeding should stop as soon as the buds show color, save perhaps for an occasional dose or two of soot water to improve the color. A slight shade on the house when the flowers begin to expand will give better quality flowers, but it must not be overdone or the flowers will be too soft. A slat trellis that may be removed on dull days is best for this purpose.

This is the last chance to get Bouvardias, Stevias, and other forcing plants potted up or benched. Freezing weather may be experienced at any time now, and even if it does not freeze, a succession of cold nights will harden the wood too much.

Bulbs for forcing should be potted up as soon as received, and placed outdoors to root well before being taken in to force. Tender bulbs, such as Lilies, Frezias, etc., should be stored in a frame, until they have rooted. *Spiraea* clumps should be potted up and set out doors to freeze. Just as soon as the leaves fall from the potted fruits they should be stored in a cool cellar, barn or garage. Not because they are not hardy, but they are liable to winter kill on account of the restricted roots.

All bedding plants that are to be propagated heavily should be brought indoors without further delay. Old plants of *Alternanthera*, *Hydrangea*, *Geraniums*, *Fuchsias*, *Vinca*, etc., may be lifted, and stored, to furnish cuttings later.

Acacia, *Azalea*, *Camellia*, *Genista*, and other hard-wooded plants must be brought into the storage pit or cool greenhouse at once. Withhold the water somewhat, but don't let them get so dry that the leaves turn yellow.

Roots intended for forcing should be ordered at once, or, if you have your own grown at home, lift them any time after the tops have died down.

Roses that are growing freely will be benefitted by applications of liquid cow manure. Keep the heating pipes painted with sulphur to hold mildew under control. Red spider should be looked after on all fine days with a good stream of water from the hose in capable hands.

Carnations require to be watered carefully where the soil has a tendency to be heavy. Light soils dry out more readily. The flowering shoots require to be disbudded, and all dead leaves and growths picked off. Wire and strings for support should be put in place as the plants demand it.

Palms and stove plants require a period of rest; therefore, as Winter approaches, do less syringing and give less water at the roots. Do not allow them to suffer for want of water, but withhold it just enough to check growth, and hold it that way for some time to come.

Seeds of *Clarkias*, *Stocks*, *Annual Lupines*, *Schizanthus*, *Nicotiana*, *Rhodanthe*, *Mignonette*, and other annuals intended for forcing, all do well under pot culture with the possible exception of *Mignonette*, which does better planted in the bench.

NATIVE FLOWERS FOR THE WILD GARDEN

WHY a wild garden? The term might be considered a misnomer by some people, yet it is very expressive of what is intended. In our gardens there is generally some spot where many of the regular cultivated flowers cannot be grown with success. In such spots, plants which flourish in the wild state, particularly those which endure shade, can be utilized to produce delightful effects. For an individual who is fortunate enough to have more land than can be looked after as a well-kept garden, a wild garden also offers an opportunity to obtain some charming effects with very little expense or labor.

There is another strong reason why a wild garden can

be made attractive in reality as well as in theory, namely, that some of our best native flowers will do far better as near natural conditions as you can provide for them than they will under the more artificial conditions of our planned gardens. Of these flowers, the *Trillium*, *Hepatica*, lady's slipper, and cardinal flower are examples.

As a rule, the site of our wild garden is not difficult to decide upon; it is generally a matter of "Hobson's choice"; but the preparation of the site is of some importance. Very often we can get rid of rocks, stones and all kinds of rubbish by using them as foundation material. It is necessary that the wild garden should have good drainage and, if it is not possible to procure earth from the woods, this coarse material will become of great value. About six inches of soil should be placed on the top of the foundation material. Such soil may consist of a mixture of sand, leaves, and even such material as moss, in order to provide a spongy-like soil, approximating the soil in which such plants grow under natural conditions.

A quantity of moss gathered from the woods and laid over the surface, with spaces at regular intervals at which to place the plants, is also another way of reproducing the natural conditions for the plants. The moss keeps the soil damp, and prevents it from becoming too compact. Large rocks can also be used to advantage, especially if the wild garden is raised above the level of the surrounding area, as they can be used to border the area and to prevent the soil washing out; they are valuable in providing cool crevices for roots of the plants.

There is, perhaps, a greater delight in creating a wild garden than in any other form of gardening, for the simple reason that each batch of plants added to the wild garden generally recalls some pleasant excursion into the woods or the surrounding country for the purpose of collecting them. Fortunately almost all wild plants can be collected most of the Summer, as owing to the shady nature of the spot in which they are planted, they are not so liable to be killed out by the sun. Recognition, however, must be given to the fact that they must be collected with care and judgment, and planted with skill. With this proviso, a plant can be added to our wild garden as easily in Summer as in the more suitable season of early Spring, although early Spring or late Fall are the ideal periods to collect the plants. It is often necessary, however, to take them when we can get them; this, with many persons, is when the plants are in bloom. If the plants are collected at such times, it should be remembered that specimens should be taken which are just past bloom, as they are more likely to recover than specimens which are in full bloom. Ferns collected in Spring will generally make magnificent growth during the same season, provided they are collected just as the fronds are uncurling. A few cardboard boxes or an old suit case will answer for collecting wild plants, as the foliage of the plant should never be allowed to wilt.

When planting, do not place the roots into the soil as firmly as it is customary with cultivated flowers. Do not make the mistake of attempting to complete your wild garden in one season. It is far more enjoyable to build it up gradually over a period of several years, and the results will be far more satisfactory.—J. E. BUCK, *Canadian Agriculturist*.

The man that's clean inside and outside; who neither looks up to the rich nor down on the poor, is considerate of women, children and other people; who is too brave to lie, too generous to cheat and too sensible to loaf; and who takes his share of the world's goods and lets other people have theirs, has the characteristics of a true gentleman.—*Doherty News*.

Chinese Rhododendrons

TWENTY-FIVE years ago the Himalayas were considered to be the headquarters of the genus *Rhododendron*. In these few short years so many new species have been introduced that we have abundant evidence in our gardens today that China is the native habitat of the greatest number of species. French missionaries, Père Delavay, Abbé David and Père Farges, sent home seeds of several of the earlier introduced species to France. We are, however, indebted to Mr. Ernest H. Wilson, Mr. George Forrest and those who have so generously financed their expeditions, for by far the larger number of new species recently introduced from China. Today upwards of 300 named species are in cultivation, and many more seedlings are growing under numbers.

Thanks to the hybridist, Rhododendrons are our most valuable evergreen flowering shrubs, and the Azaleas supply the richest coloring in the pleasure grounds during May and early June. The newer Chinese species appear to possess almost boundless possibilities in the hands of the hybridist. In sheltered positions the first flowers of *R. sutchuenense* open during early Spring. Onwards until July and August a succession of flowers open with unflagging interest, terminating with *R. auriculatum*. This species and *R. discolor*, which flower about mid-Summer, should in the hands of the breeder give us a valuable race of summer-flowering evergreen species.

Rhododendrons as a whole are well known to prefer a somewhat moist position and shelter from the midday sun. It is doubly necessary when planting the species named to give shelter, or the blossoms are very short-lived, opening as they do in the height of Summer.

As an indication of how widely the newer introductions vary in habit, collectors tell us that in China *R. calophyllum* is an evergreen shrub or tree up to 50 feet high, while leaves on some of the plants in cultivation exceed 1 ft. in length. At the other extreme we have *R. prostratum* a few inches high, and *R. intricatum* with leaves a quarter of an inch to half an inch in length. Similar comparisons may be made in the flowers. *R. discolor* and *R. auriculatum* have blossoms 4 inches to 6 inches in diameter, while the flowers of *R. micranthum* are a third of an inch to half an inch across.

With such a varied and interesting genus of plants no wonder can be expressed at the enthusiasm of amateur and professional horticulturists in the *Rhododendron* family. The war obviously has hindered developments during the last five years, but interest now must expand in all directions with so much valuable material at hand.

Peat has been considered indispensable for the cultivation of Rhododendrons, but while a certain amount may be used with advantage, the fact that it contains no lime is the reason why Rhododendrons revel in districts where peat is abundant. Mr. Forrest is of the opinion that some at least of the new species should thrive in soil containing lime, and it will be interesting to watch experiments in this direction. In the light sandy loam at Kew Rhododendrons are a leading feature. When preparing beds

or stations for Rhododendron leaf-mold is freely mixed with the Kew soil. Truck-loads of peat have been used in days gone by, but the amount used has gradually diminished, and frequenters of Kew will admit that the plants have not suffered in consequence.

While some shelter from the heat of the midday sun is an advantage in the cultivation of our present race of evergreen hybrid Rhododendrons, with at least a considerable number of the new Chinese species shelter is most important. *R. sutchuenense*, *R. Williamsianum* and *R. oreodoxa*, for example, because they flower early



A basket bouquet of the new water lily, Mrs. Edward Whitaker, with petals of a delicate blue, shading into a deeper blue, and stamens a golden yellow, exhibited by George H. Pring, floriculturist of the Missouri Botanical Garden, and awarded the National Association of Gardeners' gold medal at the convention in St. Louis.

in the year, and *R. discolor* and *R. auriculatum* require shelter for the flowers in June, July and August. Other species indicate by their behavior in our gardens that they are shade-loving species. *R. Souliei*, *R. oreotrephes* and *R. orbiculare* (*rotundifolium*) being notable examples. How best to provide the desired shelter will largely depend on local conditions. Shrubbery borders, usually with a western aspect, may provide exactly the conditions suitable for Rhododendrons.

Seeds provide a ready method, and with few exceptions the best means of increasing the Chinese species. *R. impeditum* (fastigate group) flowers in eighteen months from seeds, *R. racemosum* in two years, and *R. Souliei* and *R. oreotrephes* in three or four years. Cuttings of numerous species root readily in a slightly heated propagating house. The greatest success is attained when plants to provide the cuttings are grown under glass.—*The Garden*.

A Lesson on Beautifying Home Surroundings

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

In no country in the world during the past fifteen years has there been a greater amount of what is called landscape work carried out than in the United States. As a consequence, landscape gardeners and others claiming the higher-sounding title of landscape architects, have sprung up like mushrooms, among whom true artists form the minority, with the consequent result of causing the average method of laying out the grounds of country homes to be characterized by more ugliness than beauty.

In connection with the terms landscape gardener and landscape architect, the terms mean nothing as regards the capabilities of the persons using them, as the work of many calling themselves by the latter term is characterized by a conspicuous want of knowledge concerning the elementary principles of true landscape art. When applied to the art of laying out artistic and therefore beautiful gardens we regard the term landscape architect as a misnomer, although it is applicable to, and is more often used by, those whose work is the reverse of artistic because they know nothing about gardening. The term is not out of place when applied to those who make the more prominent features of their plans to consist of concrete, stone, or marble stairways, balustrades, urns, fountains, statues and topiary work; those who are willing to have these architectural gardens surrounding their homes only show themselves to be possessed of depraved tastes and incapable of appreciating the true beauties of Nature.

If the word landscape means anything at all it is "the natural aspect of the country or a representation thereof." It can, therefore, only be correctly used with that phase of gardening which uses plants in such a way as to form an artistic picture within the limits of a garden or of the grounds surrounding a house. In creating this picture the more formal and therefore the more inartistic the style the further will the picture be away from true landscape art. There is no reason why we should not have true art in the garden and no reason why a garden should be inartistic and merely conventional. The word "art" is used here in its highest sense and perhaps as good a definition of the word as any is "power to see and give form to beautiful things." The work of the artist is always marked by its fidelity to Nature. All who see natural beauty in landscape know that no imagining can come near to the beauty of things seen, art being frequently powerless to seize their full beauty, and the landscape painter has often to let the brush fall in despair. Great landscape painters like Turner and Corot have given us pictures from a faithful study of Nature, and that is the only true path for the landscape gardener, all true art being based upon her eternal laws. Any deviation from the truth of Nature, though it may pass for a time, is in the end—it may be years after the artist is dead—classified as *debased art*, and we may be as true artists in the garden and home landscape as anywhere else.

Much of the crude and inartistic work which one sees about the country, more especially that carried out in recent years, is the outcome of the false idea that landscape gardening can be taught either at college or by other means. Men sometimes take it up in response to statements that they can earn by it while learning it. Nothing which can be learned by means of memorizing rules, formulae, combined with mere manual dexterity, can be called an art, and those who place landscaping among the things capable of being taught, lower it to the level of mechanical trades, such as plumbing, which can be learned in six weeks. The artist in landscape gardening portrays a picture upon the earth by means of living plants; a landscape painter does the same thing upon canvas by means of pigments. If in its real and fullest sense the latter could be taught there could be plenty of landscape painters capable of producing works equal to those of Turner and Corot, and landscape painting would be degraded to the level of a commercial business, a level to which landscape gardening is rapidly lowering itself.

A true landscape artist cannot hand down his artistic genius to his heirs and successors, and yet many firms of landscape architects hold a reputation based entirely upon the names of real landscape artists who have been dead many years, and who, if they could come to life, would be ashamed to have their names connected with much of the work now being done.

While in its entirety the art of composing artistic pictures

upon the earth cannot be taught, at the same time there are some underlying principles connected with it which are capable of being set forth which are the same in their application to both large and small gardens, more perhaps along the lines of what not to do than otherwise, and which are additionally valuable in enabling the layman to have a sympathetic understanding of the artist's work.

Strangely enough those who make the strongest claims to teach landscape gardening in its fullest sense ignore entirely the most fundamental and necessary principle which the greatest genius in this art must have, namely, a thorough knowledge of everything connected with the living material with which they compose their pictures. In other words, a man must first be an expert gardener before it is possible for him to create a really artistic garden.

Absolute ignorance of plants is lamentably apparent in many of the planting plans emanating from the offices of many landscapists. Examples have come before me of shrubs being set down to be planted uniformly at eighteen inches apart, instead of from three to eight feet, according to their character; trees planted at three feet when twenty or more feet are necessary for their growth and development; plants which require sun, placed in positions where the sun will never reach, and those requiring shade placed in full sun; group plantings having plants of a dwarf nature placed entirely at the back of others of the tallest growing potentialities, and so on.

When a painter has finished his picture upon canvas it is completed for all time, excepting so far as time may modify the colors; but when the planting of a garden is finished the picture is very far from being complete, except in the mind's eye of the artist. If the planting has been properly devised and carried out the beauty of the composition will have to be brought out by time and will increase as the individual plants develop. This development requires, among other things, room; the full beauty of trees can only be obtained when their branches can persist down to the ground, and in many cases the spread of the branches will equal the height of the tree; shrubs require sufficient room to attain to their fullest beauty of form and to realize all their potentialities in the way of flowers, beauties which are annually destroyed in many gardens by the system of shearing and bad pruning to which they are subjected.

It is not only the effect of a composition as a whole when seen from a distance which has to be considered, but also the beauty of the individual subjects composing it when viewed from their immediate vicinity. Overcrowding plants is a very common source of inartistic effects and is generally caused by inability to visualize what a planting will look like in a few years' time. Upon one occasion two people were discussing the question as to whether a tree was or was not blocking up a vista of distant scenery. A third party who was present, but who did not happen to have much acquaintance with the general subject, was, during the discussion, trying to discover where the tree stood, and was surprised to learn that it was just in front of him and only three feet tall. The others could see in their mind's eye what the tree would be like in years to come and wanted to be sure it was put in the right place to start with.

In these days it is of course possible to surround a new house with a garden ten, twenty, or more years old by planting trees and shrubs of those ages; but apart from the question of expense in transplanting more or less full grown things, there is with many plant lovers considerable interest and enjoyment to be obtained from watching natural growth and development from small beginnings.

Before laying out a garden, owners should have, in addition to the cost of carrying out the plan, some idea of the annual cost of care and upkeep after the planting is finished. Many well-planted gardens have been ruined and all beauty extinguished because the owner could not afford the necessary expense for proper care. It is much better in every way to do only a little in the way of planting and to give it the requisite care and attention, than the reverse. The result of the former is continual beauty, and of the latter continual ugliness. Any really expert gardener can by looking at a planting plan form a close

approximation of the annual cost of upkeep involved by it, although there are very few professional landscapists who could give any definite answer if questioned upon the point.

The fundamental principle of an artistic garden is an open lawn. It should be as large as conditions will allow. In a general way all the center and interior of any landscape plan should be open lawn, as it affords a natural setting for the plantings of trees, shrubs, etc., which should be confined to the boundaries. The house should be located towards one side, and drives and walks must never cut through the middle of the grounds if a pleasingly natural effect is to be preserved.

Boundary plantings should be, if possible, so designed in outline as to obscure the boundary. This can be accomplished in the larger places by means of bold bays and promontories, with perhaps an island or two in the foreground of these when there is plenty of room. If a hedge, or fence, or wall is necessary—and either should be avoided if possible—the boundary plantings should be so arranged that they are not seen from the garden. When the property beyond the garden belongs to the same owner all the protection from animals given by a hedge, etc., can be secured by the use of the invisible protection known as the Ha-ha (a sunken fence not seen until one is actually standing over it; the word being derived from the old Anglo-Saxon word *haga*, a yard or inclosure). When the use of the ha-ha is possible some openings may be left in the boundary planting, or the planting may be in certain spots composed entirely of dwarf growing subjects so as to afford an undisturbed view of the natural landscape beyond, which by this means becomes part of and appears joined to the garden landscape, and if the latter is properly designed it will be scarcely, if at all, possible to tell at a distance where one ends and the other begins. In any case and in all connections, boundary plantings should be so arranged that the ultimate natural growth of the material used will be such as to cause the sky-line to be of an undulating form.

In connection with small places it is not always possible to obtain the full effect of boundary plantings along the lines above mentioned; at the same time, however, the idea need not be entirely lost sight of so that the outlook from the house can be upon something more than a hedge and street. In any case, the hedge assumes a position of greater importance in the small garden than in the large, as in the latter it can be often eliminated altogether. From the point of view of beauty as well as from every other, I have never been able to understand the everlasting use of privet for hedge purposes, as from an artistic standpoint it does not have a single redeeming feature. The fact that it is cheaply reproduced is a benefit not received by the planter, and even if it were its cheapness is counterbalanced over and over again in one season by the continual expense of its upkeep. The use of this privet is the more inexplicable in the face of the fact that there are so many other plants suitable for hedge purposes both beautiful and hardy, which latter, privet is not.

For the northern half of the country there is no hedge plant which from all points of view equals the Barberry (*Berberis thunbergii*). It has practically four distinct phases of beauty, which, merging into one another, gives it a beautiful character all the year round. In the Spring it is the earliest shrub to put forth its bright green foliage, which it does several weeks before privet; this is followed by a mass of golden yellow flowers. In the Autumn its leaves gradually assume a brilliant scarlet, and when the leaves fall their place is taken by its bright red berries, which remain on until after the young leaves appear in the Spring, these berries being especially effective in brightening up the garden during mid-Winter snows. This barberry is absolutely hardy and the severest Winters have no power to harm it. The upkeep of a barberry hedge costs practically nothing compared with privet, as barberry requires no shearing and is in fact spoiled by so doing. It can be kept within any required bounds by cutting out old wood close to the ground, an operation which is not requisite more frequently than once in three or four years.

At their best, hedges must be looked upon as necessary evils, adding nothing to a naturally artistic composition, but when they are required as boundary protection it is surely better to have something pleasing to look upon instead of that which is commonplace and unbeautiful like privet, which its additional feature of being kept sheared causes to introduce an element of discord into any natural beauty. Whatever reasons or excuses may be given for hedges on the outside of one's garden, it does not appear possible to advance any for sticking them about on the inside, and when these inside hedges are privet too, then a feature which is in any case bad is made ten times worse, especially in the face of the numerous beautiful flowering plants suitable for the purpose. If a screen line of demarcation between the ornamental grounds and the vegetable garden, for instance, is considered necessary it can be of flowering shrubs arranged in such a manner as to have the side towards the vegetable portion straight and the other of varying widths so that it is not a

hedge at all. Also a combination of the beautiful and the useful can be obtained by using bush or pyramid apples and pears; quinces, too, can be used for the purpose. Gooseberries, currants, raspberries, blackberries, make good interior hedges and certainly their use would afford more evidence of common sense than wasting time and money upon such a useless thing as privet. When an evergreen hedge or screen is desired, material for the purpose in the north can be found among the hardy conifers, in the south there are in addition many evergreen flowering shrubs which can be used.

What is called "tying the house to the ground" is accomplished by plantings close to the foundation. This, being under close and continual observation, should be composed in an harmonious and natural manner of the choicest subjects, avoiding all stiffness and formality.

Terraces should be shunned as introducing an element of discord. There is nothing artistic in a terrace, and the common idea that a terrace adds to the beauty of home surroundings is utterly false. When the house is built upon a hillside a terrace may be necessary, but making a terrace upon level, or practically level, ground is an anachronism destroying the harmony which should always exist in a work of true landscape art, otherwise it cannot be true.

Trees must always be an element to be considered in composing a landscape, as they form the framework of other planting, and unless they are felicitously selected happily placed and well grown, the whole composition falls to pieces. The smaller the place, the greater the care necessary in making a selection and in avoiding planting too many. When only a few can be used, these few should afford the most prolonged and maximum amount of beauty possible. Upon the smaller places and near the house upon a place of any size, the Norway and Silver Maples should be entirely eliminated from consideration. They are each commonplace and for ornamental purposes they stand among deciduous trees in the same category as the common privet does among shrubs.

Some trees around a house are necessary and desirable for the purpose of affording shade, but it is unfortunately a common practice to over-indulge in the craving for shade trees, and there are many houses too much shadowed and shut in by them, and numerous gardens are cramped and crowded by three times as many trees as the place ought to support; such places would be greatly improved by the use of the ax.

In woodland planting it is possible to create a landscape satisfying to the most artistically fastidious taste by trees alone, and all extensive landscape compositions should include a number of specimen trees so placed as to show their individual good qualities, and above all so planted and grown as to possess these good qualities in the maximum degree. Nothing mars a landscape to a greater extent and is more inartistic than an unthrifty, scrubby, starved tree, shrub, or other plant.

Eliminating from our minds the two maples above mentioned, trees suitable for the soil, climate and position can be selected from among the many others. Trees vary in their most distinctive features, as examples, some, like the Horse Chestnut and *Catalpa speciosa*, have their flowering features more pronounced than others; the Scarlet Oak and Sugar Maple are most conspicuous towards the end of the year by reason of the brilliant autumn coloring of their foliage; Lindens in the flowering season cause their neighborhood to be pervaded by a delicious perfume; oddity combined with prettiness is afforded by the Gingko; coniferous plantings are brightened by the White Birch, and so on.

An idea connected with trees for ornamental and shade purposes which appears worth mentioning, and which I have adopted with success in connection with small places where room is very limited, is to use fruit trees, apples, pears and cherries, for these purposes. Nothing is more beautiful than fruit trees in full bloom; all other things being equal, they grow as quickly as any other trees, and quicker than some; they afford all the shade required from a tree, and sooner or later there is a harvest of fruit to gather.

Monstrosities, like the usually planted artificial form of *Catalpa bungei*, and deformed horticultural specimens like the Weeping Mulberry, should never be planted. There is no more unequivocal testimony to the general poverty of good taste in gardening than the constantly recurring sight of such-like monstrosities in the gardens of people whose houses are, in most cases, furnished inside with taste and propriety. It is not much evidence of good taste when prominent firms of landscape architects include these things in their planting plans.

A person must be very peculiarly constituted who does not care for flowers, and generally speaking, apart from sentimental reasons, the flowers which are most valued are those which are grown in one's own garden. Of all the things made by man for his pleasure a flower garden has the least business to be ugly or stereotyped; and yet we find in a very large number of country places, large and small, flower beds of pattern plans,

conventional design, and the garden robbed of all true grace and artistic beauty by the bedding-out system of setting out ephemeral tropical and subtropical plants in geometrical ways. The most ugly features of the suburban place are the middle walk with a round or other shaped bed of geraniums or other plants of similar nature in the center of the lawn on each side, and when what is known as "carpet-bedding" is used, it is simply a further remove in ugliness.

To obtain the maximum amount of room for lawn and flowers the entrance walk should be upon one side combined with the drive to the garage, if there is one. This gives the largest sized open lawn the ground in front of the house will accommodate; around this lawn should be placed the flowering shrubs, which will form a background for the dwarfer hardy perennial flowering plants. It is better to have no flowers at all than that a lawn should be cut up into formal beds for their accommodation.

To many people the great advantages of gardening with hardy plants are so apparent as compared with tender bedding plants, that it would appear almost a waste of words to make any argument in favor of the former; but the argument is needed as much as ever, in spite of the tendency in recent years to a more rational system of flower gardening, for it is an undeniable fact that more than half of the flower gardening is still done with a few species of commonplace, uninteresting and ephemeral bedding plants. All the annual expenditure for this is practically wasted as in the northern half of the country it only occupies the ground for a few weeks, leaving nothing but bare ground for the remaining nine or ten months. My own experience tells me that it is possible in the vicinity of New York to have flowers blooming in a border of hardy plants for ten months in the year. It is true that this is not probable every year, but upon the average, flowers from a planting of hardy plants can be had for as many months as weeks from tender bedding plants.

I do not think the majority of people prefer tender bedding plants to hardy ones, but too often they have little choice in the matter in connection with small places, as they buy what the local florist recommends. Unfortunately, with few exceptions, superintendents of city parks who should be educators of the people in the highest and in the most artistic form of gardening, are content—sometimes they have the job only as a reward for political services and know nothing better—with what may be termed an annual pyrotechnical display of bedding plants, as it is of such short duration and of no artistic value.

Obviously there are numerous other matters connected with our subject which have been omitted from consideration, but we have endeavored to mention the more important ones relating to what to do and what to avoid in ornamental gardening. In conclusion a paragraph from Mrs. Schuyler Van Rensselaer's delightful book, "Art Out of Doors," is worth quoting:

"If now we ask when and where we need the Fine Art of Gardening, must not the answer be, whenever and wherever we touch the surface of the ground and the plants it bears with the wish to produce an organized result that shall please the eye? The name we usually apply to it must not mislead us into thinking that this art is needed only for the creation of broad 'landscape' effects. It is needed wherever we do more than grow plants for the money we may save or gain by them. It does not matter whether we have in mind a great park or small city square, a large estate or a modest dooryard, we must go about our work in an artistic spirit if we want a good result. Two trees and six shrubs, a scrap of lawn and a dozen flowering plants, may form either a beautiful little picture or a huddled disarray of forms and colors."

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 332)

science. Then too, new information and theories, are continually coming to light, and, in spite of the antiquity of our craft, there are many problems connected with it that still remain to be solved. Which reminds me of a remark by one of our foremost horticulturists, in a discussion of the etherization of plants, to the effect that our horticultural knowledge is as yet in its infancy. This is probably true and many of us no doubt will see great changes in gardening practice as time goes on. Of course in garden writings there has been, and must continue to be, a great deal of overlapping and repetition that is sometimes wearisome to the seasoned gardener, but, we sometimes need to be reminded, and, to avoid getting into a rut, it is necessary to be familiar with current horticultural literature; while for the young gar-

dener it affords a desirable means of improving his education.

VIBURNUMS

(Continued from page 333)

THE USES OF VIBURNUMS

Of the several species of *Viburnum* which we have mentioned, *acerifolium* and *cassinoides* are excellent for the borders of shrubberies; *dentatum* is a good hedge shrub, preferring a rich upland soil or a moist location; *lantana* will thrive in a dry situation and in a limestone soil; *opulus nanum* is suitable for borders and edgings; *lantanoideis* thrives in moist, and *acerifolium* in dry locations, under trees; *dilatatum*, *lentago*, *lantana*, *opulus* and *opulus sterile* in tree-like form make handsome single specimens.

PROPAGATION AND PRUNING

Viburnums are propagated by layering, by half-ripened or green wood cuttings taken off in wet weather in Summer and placed in sand under glass, the latter method being used for the evergreen species and for *macrocephalum*, *molle*, *tomentosum* and *cassinoides* and by seeds sown in Autumn.

Pruning should be done directly after the flowering season, and should be confined to removing dead branches and such green branches as are necessary to preserve symmetry.

A touch of frank friendliness, a fleeting revelation of kindly human nature, in correspondence or personal interviews, in any sphere of life, on any occasion—these things mean so much to the people with whom one comes in contact, and they make life so much more interesting. We're all human beings, living in the same old world—we're all most desperately human at heart—we may do different work, read different books, have different religious and political opinions, utterly different interests in life—but we can't get away from the fact that we've got that one supreme thing in common—our humanity, and we don't differ so very greatly in our emotions. So why stand on ceremony? Every man is your friend until he proves himself otherwise.—*Higham's Magazine*.

WILL YOU HELP SUPPRESS THE SIGN BOARD VANDALISM ALONG OUR HIGHWAYS?

At the convention of the National Association of Gardeners, held in St. Louis in September, a resolution was adopted condemning the despoliation of the beauties of the natural scenery along our highways by unsightly sign boards. It was decided to begin a country-wide propaganda to arouse an indignant public sentiment against this nuisance.

We invite every individual and organization interested in seeing the scenic beauties along our highways protected and conserved to co-operate with us in suppressing this sign board vandalism.

If interested, address

SIGN BOARD COMMITTEE

National Association of Gardeners
286 Fifth Ave., New York, N. Y.

Departments of Foreign Exchange and Book Reviews

DARLINGTON ON THE ROSE

IT is always interesting to hear what a man who thoroughly knows a subject has to say upon it, so as I was in London I took the opportunity of going to hear Mr. Darlington (the president of the National Rose Society and the author of "Roses" in the Present-day Gardening series of horticultural manuals) lecture at Vincent Square on June 29, and I was rewarded for my trouble by a clear and concise *ex cathedra* sort of statement upon the present position of garden Roses and what remains to be done for their improvement. *Mutatis mutandis* we heard a modern George Glenny laying down what were the correct properties which the ideal garden Rose of the future should possess. It was most interesting, and I take this opportunity as a note-taker of congratulating him on the simple and the clear way in which he put his facts and his views before his audience. The following is a short *résumé* of his ten points:

Form.—Raisers of new varieties of garden Roses should aim at high centres and shapely reflexing petals. The Hybrid Teas as a whole show the greatest advance. Much remains to be done in the yellows, which originated with the old Persian Yellow.

Carriage of Flowers on the Stalk.—The flower must not hang its head as in the case of Bessie Brown, nor should it be too stiffly upright. The golden mean between the two extremes should be aimed at.

Color.—The lecturer mentioned McGredy and Pernet-Ducher as two raisers who had done much to improve color, which should be (a) clear, bright and decided, and (b) fast. Sunburst is an example of a Rose with a bad color "property."

Continuous Flowering.—This is what most of all distinguishes the modern from the old-fashioned Rose. It is the greatest gain that hybridizers and seedling raisers have wrested from Nature. The old Hybrid Perpetual bloomed once a year only. General McArthur blooms periodically. Mme. Edouard Herriot goes on uninterruptedly from July until the frosts come and cut it down.

Freedom of Flowering.—Some very beautiful varieties are not free. We want the freedom of Richmond, Red Letter Day, and Mme. Edouard Herriot in all new varieties.

Fragrance.—If new Roses have gained in perpetuality, they have lost in fragrance. The Hybrid Perpetuals were sweet at any rate. Perfume, the lecturer said, can be improved, and he hoped that before very long it would be, as quite half of our modern varieties are scentless. Even in the yellows there are signs of better things. A yellow Rose shown by Mr. Henry Waller on June 29 had a slight touch of perfume. In both climbers and Dwarf Polyanthas there were but few varieties with much scent. Evangeline among the first-named class and Ellen Poulson in the second are exceptions. A point to notice about perfume is that the true Rose scent, as it is frequently called—the scent of the ancient *centifolia* and the old-as-the-hills *Damascena*—is by no means the only type to be found in the genus *Rosa*. There are Tea types, fruity types and Musk types, and I have read that one or two species almost rival the very doubtful nasal delights of *Stapelia* blooms.

Growth.—It is a fact that some varieties will not grow. Mrs. Charles L. Pearson was cited as an instance. Now, as the lecturer said with that Delphic smile of his, "A plant must grow."

Garden Habit.—There are greater differences than many imagine. It is important to know which varieties to choose for particular purposes. For example, Hybrid Teas as a rule do not make good pillar Roses. Again, varieties which make long flowerless shoots are best used where these can be pegged down in the following year.

Good Foliage.—A Rose with but scanty foliage is not suitable for bedding, as too few leaves produce a bare effect. Then the character of their surface must be taken into consideration. A smooth shining surface is a distinct and valuable asset.

The Life of a Plant.—This should always be taken into account, and if catalogs would mention this in their description of varieties it would be a great help to both young and old rosarians; it makes a considerable difference in the trouble and cost of a Rose garden. At the present moment a good deal remains to be found out. Mr. Darlington instanced three beds of Richmond in his own garden. One was sixteen, one was twelve and a third five or six years old. He had more renewals to make in the youngest than in the oldest, and he could not account for it. He tilted at overpropagation, and said he had

read of a case where a single strong plant in the February of one year became 18,000 in the September of the year following. Such a feat is possible, I have since been told in the United States, where growing Roses from their birth to their grave has been reduced to a fine art. In our climate such a feat is most probably impossible, so we must not be unduly nervous about what *might* happen, for propagation on the same grand scale is unlikely here.

The above heads are as it were the dry bones of an interesting and instructive lecture. I have not the requisite knowledge to comment upon it or to amplify it as I should like to have done, but that does not in the least matter, for the *ipsissima verba* of the President are to be published in the next Royal Horticultural Society's *Journal*, so it will then be possible to go to the rock from whence these notes have been taken, and learn in addition what he had to say about the shifting of taste, and study the lists of what in his opinion are the best garden Roses.—*The Rev. Joseph Jacob, in The Garden.*

A fine single yellow Rose, *Mermaid*.—We cannot always judge a Rose by seeing it at a show for many reasons, especially as regards its value for the garden. Having seen the above a few days ago in vigorous health, and bearing freely its handsome, large, yellow flowers, I am convinced that in this we possess a Rose of great beauty. The specimen referred to was loosely trained to a pillar, and was from 9 feet to 10 feet in height, having made this amount of growth, I was informed, during the past season. The lovely sulphur-yellow flowers, each 5 inches to 6 inches across, at once arrested attention. The depth of color in the petals was remarkable, the deep amber stamens prominently disposed after the manner of the Macartney Rose (*R. bracteata*), which surely was one of its parents. The large, glistening leaves, turning bronze with age, have that clean, healthy appearance we admire in a good Rose. Messrs. W. Paul and Sons were awarded the Gold Medal of the National Rose Society in 1918 for this fine introduction.—*Gardening Illustrated.*

HYBRID DELPHINIUMS

Judging by the number of flowers whose names have some connection with bird form, in the minds of nature lovers of long ago there must have existed some fanciful association between the two. The curious spurred nectaries of the *Delphinium*, which give the flower its peculiar quaintness, suggested a dolphin's head and then came the name *Delphinium* from *dolphin*—meaning a dolphin.

Today no garden is complete without a representative collection of the Hybrid Forms of these beautiful flowers and the old strains have been so much improved and developed that they would scarcely recognize some of their descendants. When we consider the numberless varieties at our disposal in A.D. 1920, it is rather instructive to read in one of the most reliable catalogues published in 1817, that the species and varieties at that time totalled nine.

This will serve to show us the leaps and bounds with which delphinium culture has proceeded and how much better off we grumbling gardeners are today than people were at the time of the Battle of Waterloo. Then the flowers had narrow petals so crowded together that much of the beauty, both of color and form was lost and one cannot help wondering what the gardeners of long ago would say could they see the modern stately spikes with their large blossoms ranging through all the most delicious shades of purple, to heliotrope blue, lavender and sky blue, forget-me-not blue, gentian blue and azure—so the grand color symphony goes on. *D. zaili*, from Afghanistan, has pale yellow flowers. *D. moerhousii* pure white, and besides these there are the crimson flowered species.

D. elatum, the Bee Larkspur, was introduced into European gardens from Siberia over 300 years ago and to it we no doubt owe those varieties with bee-like centres to their flowers which we have today. It would be difficult to trace back the origin of the new forms which are constantly being raised, so much crossing and inter-crossing has gone to create these achievements of the florist's art. All are hardy and quickly establish themselves in any well-cultivated border. There is a great variety of color and form—some have double flowers, some single, some are tall, some dwarf. A mixed bed of hybrids with the taller ones planted in the middle may be made a thing of great beauty. Is not the delphinium patch invariably the brightest spot in the garden?

The flowers seem to diffuse light wherever they are.—*South African Gardening & Country Life*.

CALIFORNIA TREE POPPIES

When *Romneya Coulteri* does well it is one of the most conspicuous of the flowers of middle and late Summer. The 6-inch wide milk white bloom with its large tuft of bright yellow stamens is seen from a long distance, and a nearer view of the clear-cut glaucous foliage shows a plant of great beauty and distinction. It grows to a height of 7 feet, in a bush-like mass, thriving in a deep, light soil in a sheltered, sunny place, best of all near a south or west wall. When well established it runs freely underground, some of the more adventurous growths coming up two or three yards away from the parent plant. In this way it will pass under a gravel or paved path, appearing as healthy young plants on the further side. It will even pass through or under the foundations of a wall. Young growths so formed look tempting for transplantation but this never succeeds. It is best grown from seed, though it is easy to strike in heat the young shoots when they are just pushing up from the base in Spring. The petal is so transparent that if laid on a page of bold type the print can be read through it. It has an excellent scent, something like a combination of Primrose and *Magnolia*. It is nearly allied to *Platystigma*, also plants of American origin, and, with them, is a branch of the Poppy family. California Bush Poppy is its popular name.

In your note upon *Romneya Coulteri* you speak of the difficulty of moving young plants which are the offsets from the main plant, and therefore I think I ought to tell you that I have never had a failure, but that a few months previous to moving a plant I have always cut the runner from which it has sprung. I have always looked upon them as the easiest plants to move.

Reference has been made to *Romneya Coulteri* thriving best in a well drained but poor soil. For several years I have had very conclusive evidence of the truth of this assertion. Mr. P. Kitcher, head-gardener to Major Wyndham Pain, Bransgore House, Christchurch, has a remarkably fine specimen, many feet high and as far through it, growing in a rock garden on a natural slope and in a very hot position. The flowers are of immense size and very fragrant. When the buds are just showing color they are cut and placed in water, where they gradually open fully. Suckers grow freely from this plant.—*The Garden*.

THE SHIRLEY POPPY AGAIN

The best time to cut these Poppies is the evening before they are due to open, the likely flowers being known by their upright position, and being thus easily distinguishable from the less mature buds, which retain the "swan's neck." Flowers so cut and placed immediately in hot water open the following morning as if they had been left on the plant, and remain for a longer time fresh than those cut in the morning. Also for sending by post, cut in the evening, placed for a little in an inch or two of hot water, packed firmly and posted for the evening post, they will travel unhurt any distance covered by a night train, and, on reaching their destination, will emerge from their wrappings like a bunch of tropical butterflies newly issued from the cocoon. It is also worth noting that flowers cut in the evening before expansion retain much longer than flowers cut in the morning those creases and corrugations which are such a charming feature of the freshly blown Shirley Poppy. I might mention also that for flower-loving invalids, confined to room or bed, the Shirley Poppy is a flower of flowers. The Poppies may be brought to the bedside while as yet shaggy and colorless buds, and, in the too often tedious hours of early morning, they will play for the wakeful invalid their little flower drama with the spirit and variegated grace of a *corps de ballet* from the Alhambra. A transformation scene indeed! Also these Poppies have little or no smell, and for some invalids those flowers smell best that smell least.—*The Garden*.

WHITE-FLOWERED HARDY PLANTS

The white hues of flowers sometimes produce a disquieting effect, perhaps never more so than when a single white-flowered plant gets into a combination otherwise quite free from white or cream. The effect is to arrest the sight, draw attention from the rest of the flowers and concentrate it almost wholly on the one plant among the many. But, apart from instances such as this, white flowers, if properly employed, are of great value in the garden.—*The Gardeners' Chronicle of London*.

A Black Flower.—The color black is hardly met in the world of flowers. The wild ginger, the dark larkspur and one or two other plants have corollas of a blackish brown. It is known that the *Oncocyclus* group of irises, of oriental origin, have flowers of white ground more or less spotted with black.

Now we have at this moment in flower, at Florair, writes

M. H. Correyon, a sage, semi-frutescent, of which the tips of the flowers present a color positively black. Humboldt and Bonpland, who have described it, give it the color blackish violet; but the lips of the flower, which are the only part in evidence, the throat being concealed by the long and large calyx, are positively black, of a beautiful silky black, or rather of the black of velvet. It is a plant of upright habit, glandulous and viscous, with leaves broadly entwined and of bright verdure. It is extremely rare in the gardens and is scarcely met in the collections of specialists. Nevertheless it has a beauty of its own and merits the attention of the lovers of beautiful plants. Its foliage is strongly aromatic.—*Le Jardin*.

A Variety of Viburnum Carlesi.—The *Bulletino* has already made mention of this species which, in spite of its absolute decorative value is not yet known in our gardens. Now the *Bulletin of Miscellaneous Information from Kew* describes a variety which, if it has not greater merits than the type, is in every way worthy of being introduced to cultivation. The variety is called *Syringa flora* through a certain resemblance which the florets have to those of the lilac.—*Bulletino della R. Societa Toscana Di Orticultura*.

Ridiculous Patriotism.—A French rosarian has published the catalog of his firm with the omission, in the collection of roses, of all the names of the rose of German origin, indicating them simply with a number. This is simply ridiculous! Has he perhaps believed that he could destroy the genealogical history of these varieties obtained in Germany or dedicated to a German personality? If he had been possessed by his own spirit of patriotism he would have given, in his collection, the ostracism to all German varieties; but these are as they are and they will remain such also without naming them.—*Bulletino della R. Societa Toscana di Orticultura*.

Delphinium, The Alake.—Many of the finest Delphiniums are so formal in the form of their spikes that it is a pleasure to see some of the newer ones which do not conform to the close-habited, thick-set columnar spikes which mark so many, yet with all the good qualities of form of flower, size, and color which distinguish the individual blooms of the best perennial Larkspurs. With *The Alake* it seem difficult to find any fault. It has symmetrical, yet not stiff, spikes; the individual flowers very large, and of a fine bright blue or purple. The *Alake* is not one of the most recent novelties, many of which are as yet too expensive for the ordinary grower, but it is so beautiful that it cannot well be dispensed with.—*Gardening Illustrated*.

HERBACEOUS PHLOXES

Of all hardy flowers in the garden none is more appreciated than a collection of desirable varieties of herbaceous Phloxes. Commencing to flower early in July and continuing until the middle and sometimes the end of October, they make a bright patch of color. They are very useful for supplying cut flowers for indoor decoration, for which they are so well adapted, giving such a variety of color. The perfume, too, from these flowers, especially in the early morning and evening in the garden, is much appreciated, as also it is from the cut spikes in the house.

To grow herbaceous Phloxes really well and to obtain fully developed panicles of large, highly colored blooms so many persons spoil their chance of success by allowing too many shoots to grow from each plant, thus overcrowding them so much that the growth is weakly and, consequently, the blooms and flower panicles are small. Such plants, too, are more difficult to support: when they are tied to one central stake in besom-like manner the shoots are more crowded still, each stem being robbed of its share of light and space. To obtain success the foliage must be fully developed, and this can only be done by spreading the shoots out with a separate stake, say, six or eight growths to the largest clump is ample, removing all others, naturally selecting the strongest directly the growth commences.

Phloxes will succeed in almost any kind of soil provided it is deeply dug and well manured. The plants cannot flourish under too dry conditions; they revel in moisture at the root, a light mulch of manure, leaves or even straw during dry, hot weather while they are sending up their flower panicles is very beneficial. Some slight shade is an advantage, for instance, a border facing west is a gain in keeping the roots cool. Liquid manure applied judiciously is much appreciated by the fast developing panicles of blossom. Phloxes are easily increased by division of the roots and by cuttings of the young shoots when 3 inches long, early in April, and inserted in sandy soil singly in 3-inch pots, stood in a close cold frame, kept shaded until roots are formed, which is quickly done, when they should have abundance of air, and when well established they can be put out where they are to flower or shifted into larger pots to bloom in the conservatory, where each will give one stout panicle of flower.

The following varieties are desirable: Miss Pemberton, carmine rose, darker centre, 3 feet; General Van Heutz, 4 feet, brilliant

salmon pink, one of the best; Elizabeth Campbell, 3 feet, pale salmon pink, this is an exquisite variety in every respect; Selma, 3 feet, pink with a crimson eye, large flowers on a huge panicle; Sheriff Ivory, 3 feet, light rose, with a deep crimson eye, compact growth and late flowering; Iris, 3 feet, bluish violet, blue centre; Eclairer, 4 feet, carmine, large blooms, early flowering; Etna, 4 feet, orange scarlet; Europa, 3 feet, snow white, with carmine centre; Baron Von Dedem, 3 feet, rich scarlet; Marconi, 2 feet, pink, crimson bars and deeper eye; Thora, 3 feet, salmon, free branching habit; Le Mahdi, 2 feet blue, excellent; Aeger, 3 feet, crimson scarlet, late; Antoine Mercier, 2 feet, lilac when opening, increasing in tint with age; Hanny Pfeiderer, 3 feet, compact habit, creamy white, with salmon eye; Asia, 3 feet, huge spikes, lilac rose; Mons. Kind, 3 feet, brilliant rosy orange; Steuben, 3 feet, rich cerise crimson, brilliant color; Reich Graaf Von Hockling, 4 feet, dark blue; Thynstroom, 3 feet, rose, with lighter eye, very effective; General Pau, 3 feet, bright orange red, compact flower heads.

Of white flowered varieties there are a number to choose from. In my opinion the best is Frau Von Lausberg, 3 feet, stiff habit of growth, needing no support, good foliage, large panicles of pure white huge blossoms. Tapis Blanc, 1 foot 6 inches; Sylphide, 3 feet; F. A. Buchner, 3 feet; Virgo Marie, 4 feet, is the best late flowering variety, very free, with small panicles, most useful for cutting.—*The Garden*.

The copious rains have come just in time for the Phloxes, which were beginning to show signs of their dislike to the drought, for no plants are so quickly affected, especially if they are on a light, dry soil. Where one has to grow them under such conditions it is advisable to make special provision in the way of removing a portion of the natural soil and filling up with a mixture of loam and chopped cow-manure in the proportion of three to one. Given this and a mulch in hot, dry weather one is fairly certain of a good, long-sustained flowering season and some fine heads of bloom. A partially shaded position is the best for them, especially the highly-colored selfs, like Coquelicot in the scarlets and Le Mahdi and William Ramsay in the purples, as these are apt to scorch under the influence of a powerful sun. The lighter shades are not so easily affected, but a strong point in favor of partial shade is the considerably extended flowering season.

All varieties are valued for cutting for large vases, special favorites being the very delicate shades, of which Eugenie Danzanvilliers may be taken as an example, and all the newer types stand as well cut as in the border if decaying pips are promptly removed.

When stools are allowed to remain in the same place for several seasons (and there is no reason why they should not do so if the ground is well prepared at the outset) it is advisable to thin out the growths, leaving about five of the strongest, as bigger heads and individual pips are thereby obtained. Although quite at home with other things in the hardy plant border, I think the Phloxes are seen to best advantage alone in large beds, when the colors can be arranged to give a pleasing and effective display. I wrote "alone," but if planted thinly, which is advisable, so that each variety is seen clearly and distinctly, intervening spaces may be filled with Tufted Pansies or some very dwarf, long-flowering annuals.—*Gardening Illustrated*.

BOOK REVIEW DEPARTMENT

Correction. Acknowledgment is cheerfully made of a courteous letter from Captain George C. Thomas, Jr., objecting to certain items in last month's review of his *Practical Book of Outdoor Rose Growing*. Regarding the fact that he apparently bases his estimate of roses only upon observations made in his own gardens he cites an account of explorations and of conferences with other eminent rosarians, all over the country and even extending up into Canada, that are astounding in extent and thoroughness. It is to be hoped that he may soon publish the narrative, for it would certainly be interesting and instructive. It was not due to lack of observation in others' gardens that climbing Bess Lovett and Alida Lovett were omitted by him. He has not found them hardy in spite of their thriving at Washington. Yet growers in New Jersey, near New York City, have them forming blooms upon wood of the preceding year. Evidently, then, the matter of hardiness is often a difficult one to handle. Engelman's spruce, for example, which luxuriates under the buffeting of tremendous storms high up among the Rocky Mountains, does not find congenial the dry cold of the northern prairies. The writer has always found that the rose Gruss an Teplitz, several times referred to by Mr.

Thomas as remarkable for its hardiness, kills back nearly to the ground in north-central Ohio. Premier and Madame Butterfly for Mr. Thomas have not succeeded. Of them, accordingly, it might be asked if they may not yet adapt themselves so as to earn the change of opinion to the better attained by Climbing Gruss an Teplitz, which, according to page 127 of the book, "has not been successful, as during the second year, on two plants, less than a dozen blooms appeared during the season," but of which one reads, on pages 222 and 223, "One rose stands out as fulfilling the conditions of an ever-blooming hardy climber. . . . It takes time to become established; and if it does not bloom well after its second year, it should be root pruned or moved to insure blooming wood. Its habit is most vigorous and hardy and when well grown it blooms most prolifically from Spring until frost." Obviously then one is to take into account that the present edition of this splendid book is the edition of 1916 with only a new chapter, *Rose Development From 1917 to 1920*, appended, and interesting and valuable chapter to which, by the way, attention ought to be directed by the Table of Contents.

As to providing in the Score Card for a place to set forth in detail the habit of the plant and its appearance in the garden the reviewer must admit that this can be attended to under growth. Is not this a point deserving of much more attention than is ordinarily given to it in the selecting of roses for outdoors? As to roses for certain sites a second reading shows that very many points, perhaps enough for almost every planter, are treated here and there in the book, points which it would be hard to tabulate. The use of species for "wild" planting is a subject that would hardly come within the scope of a book of this nature. It is an exceptionally excellent and inestimably valuable book of remarkable accuracy. Who could write a book that every one would find flawless?

THE ADVENTURES OF A NATURE GUIDE, by Enos A. Mills; cloth, XVI+271 pages, 8vo., with 32 full-page illustrations. Doubleday, Page & Co., Garden City, New York.

It may be questioned whether the person who confines himself to a garden made with hands does not miss much. Man's original progenitor was "put into the Garden of Eden to dress it and to keep it." Some persons garden from necessity and others because of a realization of advantages to be obtained, while in the case of still others it is a hobby or a pastime. But gardening, like other pursuits, may become constraining or absorbing. A person in such a case is too apt in his love of Nature, not to "hold communion with her visible forms" and to him she hardly "speaks a varied language." She should not be a mother imposing drudgery upon her children. On the contrary, declares Mr. Mills, "irresistible is Nature's call to play. The call comes in a thousand alluring forms. . . . She pictures alluring scenes in which to rest and play; in mysterious ways she sends us eagerly forth for unscaled heights and fairylands." "It is seriously splendid to play with wild winds. There is no greater joy than wrestling nakedhanded with the elements. Life in the wild places is not all struggle, not all hunger, fright and fasting. All wild animals find time to rest, and all, from time to time, give themselves up to play."

The author leads one, in a most fascinating manner, with eloquent words, into the wild places; but he shows us that the wilderness is one of the safest and most interesting places on earth. In fact, he records more dangerous encounters with human beings, a stockman and prospectors, to whom his ways of examining trees, in the Rocky Mountain National Park, were mysterious, incomprehensible and suspicious. From the elements, however, he did once suffer most critically. Snowblinded for two days he wandered, at an altitude of 12,000 feet above sealevel, along the edges of precipices, with feet nearly frozen and once knocked down by the onrush or concussion of air as, with terrific crash and roar, a snowslide swept into the canyon a short distance in front of him.

The book is strikingly different from all others, thoroughly original and thrilling and throbbing with the heartbeats of Nature pulsating poetry in a manly man who, through his "winged words," not inappropriately to borrow an expression from Homer, guides the reader's thoughts to Nature, as he has sympathetically conducted in reality willing children who have learned from this Nature Guide.

With hand on the spade and heart in the sky,
Dress the ground and till it;
Turn in the little seed, brown and dry,
Turn out the golden millet.
Work, and your house shall be duly fed;
Work, and rest shall be won;
I hold that a man had better be dead
Than alive when his work is done.

—Alice Cary.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

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Vice-President—D. L. Mackintosh, Alpine, New Jersey.

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ANNUAL CONVENTION HELD IN ST. LOUIS SEPTEMBER 14-16, 1920

Officers elected for 1921—President, W. N. Craig, Brookline, Mass.; Vice-President, George H. Pring, St. Louis, Mo.; Secretary, M. C. Ebel, New York, N. Y.; Treasurer, Peter Duff, Orange, N. J.

Trustees for 1921—William H. Waite, Arthur Smith, D. L. Mackintosh, New Jersey; L. P. Jensen, Ernest Strehle, Missouri.

Meeting place 1921 convention, New York City.

The ninth annual convention of the National Association of Gardeners (since its reorganization) was opened at the Hotel Marquette, St. Louis, Mo., on Tuesday afternoon, September 14, by Dr. George T. Moore, director of the Missouri Botanical Garden, who welcomed the members to the city of

St. Louis, jocosely remarking that, while he did not have the key of the city to present to them, he felt certain the visitors would find the freedom of the city was theirs during their stay. Dr. Moore spoke of the interest horticulture holds in and about St. Louis, and referred to the changeable climatic conditions and the smoke nuisance they have to contend with in plant cultivation, which do not exist in many other places. Nevertheless, he said, St. Louis would have much of interest to show the visiting members. In concluding his remarks, Dr. Moore introduced L. P. Jensen, president of the association, who, on taking the chair, called on M. C. Ebel, of New York, secretary of the association, to reply to Dr. Moore's words of welcome.

PRESIDENT JENSEN'S ADDRESS

In his address to the convention President Jensen said: Large and important issues have been before us during the past year, and many of these will be brought forward at this convention for our discussion and solution. I feel quite confident in asserting that this meeting in St. Louis should prove to be the most important one to our profession ever held. The reasons for this are many. We have entered into the reconstruction period following the greatest of conflicts of nations. Conditions are as yet unsettled, and we have gathered here to discuss the ways and means by which we may, on the one hand, help to restore a healthful balance of conditions pertaining to the welfare of the people of our nation at large, and on the other hand, how we may utilize this period for the uplift of our profession, and the bettering of the social and economic conditions of the professional gardener. A foundation has been laid for a larger, stronger and more powerful association, which if we do not relax, but continue to build on wisely and with deliberation and thought, will enable us to enter into questions of national importance to horticulture and gardening, which those engaged in commercial horticulture, for many and obvious reasons, are not in position to handle, but which we, who have no axes to grind, may take up and adjust with a fair assurance of success.

He referred to the reports of the various committees to be submitted, and to the subjects to be brought before the convention for discussion, urging that they receive most careful attention. If we can, he said, in the short time at our disposal at the present convention, work out a feasible and sensible solution to each and all of these questions, even if the final solution of some of them will mean a lapse of time and a contribution of individual exertion in time and material, let us put the shoulder to the wheel and keep the good work going, step by step, but each step an advance. Then this convention will have been a success and a milestone in horticultural progress.

President Jensen recommended what seemed to him of the greatest importance to the future growth and efficiency of the association, and that is, to get in close touch with the local gardeners' organizations throughout the country and permit them to affiliate with the national body. A nominal annual dues should admit such associations to membership and entitle them to a delegate at the convention. This seemed particularly desirable because of the many and varying conditions under which the American professional gardener works. The problems of gardening in the East, as compared with the West, North or South, are entirely different both as regards culture and general practice. Our strength as a national organization will depend largely on how nearly we are able to help solve the problems of the gardeners in each and all of these sections.

SECRETARY'S AND TREASURER'S REPORTS

The secretary, in his annual report, showed that 190 new members were enrolled and 66 suspended for non-payment of dues during the year. 76 owners of country estates subscribed as sustaining members, which membership list would have been materially increased if the active members had made greater efforts to interest their employers. Most of the sustaining members were enrolled through a direct invitation from the secretary's office.



The Annual Shore Banquet, Held in the Floral Display House, Missouri Botanical Gardens, St. Louis, September 17, 1920, in Honor of the Visiting Gardeners, Attending the Convention of the National Association of Gardeners, Who Were the Guests of the Event.

What proved to be of the greatest benefit to the gardener and his profession, and to the credit of the association, was the masterly address delivered by W. N. Craig on "The Point of View of the Professional Gardener," before the Garden Club of America, at its meeting in New York City last Spring, and its publication in that organization's official bulletin. As a result, the professional gardener is today regarded in an entirely different light than he formerly was by many owners of country estates. The association is indebted to the Garden Club of America for the opportunity to present the cause of the gardener to its members, who include many of the foremost country estate owners of America.

The action taken at the Cleveland convention last year to discontinue the standing committees and to have the president appoint special committees as required, was a progressive step, as is indicated by the committee reports.

The Service Bureau was a busy department of the association during the past year, bringing many visitors to the office, creating an extensive correspondence, and involving considerable additional work for the secretary, who directed the attention of some critical members (who, from the tone of many letters received, appeared to be under the impression that the entire time of the secretary is at their disposal) to the fact that his position is not a salaried one, and consequently, he has to devote some of his time and energy to matters pertaining to his own personal business.

The Publicity Campaign of the Service Bureau has advertised it well and estate owners are beginning to learn of this source to which they may turn when seeking the services of efficient gardeners. The strong contention that the Service Bureau would never be more than a local service, and could not serve a national purpose, was upset by the visits to the office of country estate owners from Ohio, Illinois, Virginia, Kentucky, Georgia, and Florida, besides many others from eastern states, with communications from as far distant as Arkansas, Nebraska and Montana. What may be regarded as the greatest achievement of the Service Bureau in its efforts to bring country estate owners and their gardeners into closer and more confidential relations, was the success in turning what had been classed as impossible positions into desirable ones, by placing gardeners qualified to meet the particular requirements which the position called for. Those who are most familiar with the operation of the Service Bureau fully realize that it is still far from perfection, but that it is constantly developing to meet the aims for which it is intended.

The secretary's financial statement showed collections from dues and Service Bureau Publicity Fund amounting to.....	\$5,155.00
Expenses of the secretary's office and of the Service Bureau for postage, telephone and telegraph toll, stationery, clerk hire, and the secretary's traveling expenses, amounting to.....	\$1,507.54

The treasurer's report showed disbursements for members' subscriptions to the GARDENERS' CHRONICLE, advertising the Service Bureau, publishing the 1919 convention report, 1919 convention expenses, general printing, and the secretary's office expenditures, making total disbursements	\$5,016.72
Balance in bank September 10, 1920.....	2,018.70
Investment Third Liberty Loan Bond.....	1,000.00

The secretary's financial statement and the treasurer's report were audited by L. P. Jensen, Peter Duff, George H. Pring, auditing committee.

SPECIAL COMMITTEES' REPORTS

Service Bureau Publicity Fund Campaign Committee. Alexander Michie, chairman, reported that 262 members contributed to this Fund, which amounted to \$1,432.00. It had been estimated that at least \$2,500.00 would be collected for this purpose, and as the results were so disappointing, the committee recommended that some other method be introduced at the convention to secure the necessary funds to continue the publicity and other expenses of the Service Bureau.

Committee on Quarantine Bill No. 37, W. N. Craig, chairman, reported that at the conference held by the association in New York City last spring, it was unanimously voted to endorse the action taken by the Massachusetts Horticultural Society to hold a conference of all horticultural bodies interested in the exclusion act. This conference was held in New York City on June 15, at which the National Association of Gardeners was represented, and a strong committee appointed which, it is hoped, will be heard from further in an emphatic way. The National Association of Gardeners, while co-operating in every possible way with

other organizations that are seeking at least a partial letting down of the bars erected against the importation of practically all plants and many bulbs, plans to continue aggressive work on its own account, and since the June conference aforementioned, has been successful in interesting a number of the employers of the members in the injustice of Quarantine Bill No. 37. It hopes, with their support, to obtain such modifications of this quarantine that plants and bulbs which cannot be produced in the United States may be imported under proper, practical safeguards, so as to preclude any possibility of their carrying dangerous insects and diseases, and thus raise the rigid embargo which shuts out many plants and bulbs that our gardens need, and which are very unlikely to bring in injurious insect pests and diseases.

A motion offered by Montague Free of New York, that the convention go on record as heartily approving the good work accomplished by the Committee on Quarantine No. 37, during the past year and authorizing the committee to continue its efforts to secure a modification of the present drastic regulations; always bearing in mind that as Americans, we stand on all things for America and with "Safety First" in all that concerns our great country, was unanimously carried.

Committee on School Gardens, George H. Pring, chairman, appointed at the Cleveland convention to assist in the school garden movement in Cleveland, submitted a report to the Cleveland Board of Education (as published in the GARDENERS' CHRONICLE), which was accepted by that Board. The outcome was the installation of a Normal School course in horticulture for the regular summer term, or six weeks, to which the chairman of the School Garden Committee had the honor of being called to Cleveland as an instructor. The class included upwards of forty members who were a part of the school garden teaching corps.

Committee on Interesting Young Men in Gardening, M. C. Ebel, secretary. Following a lengthy discussion at the Cleveland convention on the subject of interesting young men in the profession of gardening, an advisory committee was appointed to co-operate with the secretary and all parties interested to formulate some definite plan to interest young men in gardening, and to provide the necessary training for them by taking the subject up with country estate owners who have the facilities to offer.

Owing to the committee being widely scattered throughout the country, it has not been possible to get the committee together for a meeting, so in order to keep the movement alive and to report favorably at this convention, the secretary has taken upon himself to do what could be done, seeking the advice and co-operation of the committee through correspondence.

A communication was addressed to the prominent members in the trade, catering to the gardener, asking them to co-operate and also to give such financial support as they could to get the movement under way, which would involve an expense in advertising and issuing of literature. Several concerns responded that they were interested in the subject. Lord and Burnham Company contributed \$100. Contributions were also received from F. F. Drury, of Cleveland, (J. H. Francis, superintendent), for \$100; from E. D. Speck, of Grosse Pointe Shores, (W. H. Griffiths, superintendent), for \$20; from James B. Duke, Somerville, N. J., (James Dymock, gardener), for \$25.

A number of plans were proposed and considered, and the secretary was finally able to interest the School Garden Department of the United States Bureau of Education at Washington in its plans. The co-operation of this department has been offered to the committee, and such publicity as will be necessary, furnished to the public press by the department, to call attention to the opportunity the profession has to offer young men as soon as the association is ready to provide positions for those who may manifest interest in taking up the work.

The subject was taken up with several estate owners. Recently Pierre S. du Pont visited the association's office in New York, as he is keenly interested, and said he will do all that is necessary to furnish the proper facilities to train from eight to ten young men on his estate, and we shall have the whole-hearted co-operation of Mr. du Pont in what we are endeavoring to undertake. J. Ogden Armour, through his superintendent, has advised that he will provide for four young men on his place, and negotiations are under way with several other estate owners, which have not advanced far enough to report on at this time. Your secretary believes, from what has been accomplished so far, that there will be no difficulty in obtaining desirable young men, earnest in their intentions, to take up the profession of gardening; and that if the subject were presented to the owners of many estates by their superintendents or gardeners, there would be many openings for such training. The lack of interest shown on the part of those members who could effectively co-

operate in this work is regrettable, for it is an important undertaking which, if it fails, will reflect unfavorably upon the association and the profession which it represents.

The Committee on Co-operation with the Federal Board of Vocational Education, M. C. Ebel, chairman. On the request of a representative of the Federal Board of Vocational Education, who addressed the convention in Cleveland last year, a committee was appointed by the president to co-operate with the Board to aid disabled soldiers, by placing those who desired to take up the training of gardening in positions, that would provide such an opportunity.

During last Winter, the association's office was visited frequently by a member of the board to remind the committee that it counted on the association to place a number of boys in the Spring, it being claimed that some 250 boys would be available. When Spring arrived, the committee took the matter up with the superintendents of several estates, who agreed to provide for soldiers on their places, the owner of one estate agreeing to provide accommodations and training for eighteen.

When the board was called on to provide the boys, it was found that it was not able to do so, and in all, six boys were sent to the office, of which one qualified temporarily, the remaining being all of a type not suited for a country estate. The committee can only report that its efforts were a failure, with many explanations necessary to those who had agreed to accept the boys and make provision for them.

The committee does not desire to appear as if criticizing the board unjustly, but believes the blame rests on an over enthusiastic representative, who exaggerated the claims he made of the boys he had to place, and who probably counted on many being available when Spring came to hand, for whom he was going to be prepared, placing the committee to considerable unnecessary work.

COMMUNICATIONS AND RESOLUTIONS

The following communication was received from the Newport Branch of the National Association of Gardeners:

"To the Members of the National Association of Gardeners, Assembled in Convention in St. Louis:—We regret to confess in so far as making further suggestions for the good of our association, that this branch is practically at a standstill for want of co-operation. We look with some concern upon the probable findings of the coming convention in relation to the very important subjects to be dealt with. We are of the opinion that before subjects of this nature are passed upon, a thorough representation of the majority is a necessity. Will you have this condition at St. Louis? Is it possible at the present stage of our development to secure a majority attendance in any part of the United States? We think not. We believe there are certain foundations to be laid before the association as a unit can continue to build and prosper. We believe the establishment of local branches in various parts of the country as previously suggested, is one important foundation upon which the association would benefit a great deal.

"St. Louis and Newport are the only branches of the N. A. G. in this vast country as far as we know. Members of the association are scattered thousands of miles apart and have no means of coming together officially to help and interest others in the work of our association. Other up-to-date organizations have their branches, for instance, the Garden Club of America, whose members are more active in their organization work than we are. Why? Because they take more interest in their work and attend their local meetings. This country is too large to have a national organization such as ours with only headquarters in New York; we need more co-operation among the members, and branches seem to us to be the only means of getting it. Even the British Gardeners' Association, small as its country is, has branches.

"Directors could be chosen through the local branches among such men as are known to be active in the work of our association. It also helps to keep up the interest of the individual member in the association and its work through meetings to discuss the problems which confront the profession. It would be helpful in increasing the membership; also helpful to our secretary in filling positions where a branch is located, by giving him all possible information. These are only a few duties a local branch can undertake, and to this end, we would respectfully submit the following resolution:

"Resolved, That an article be added to the By-Laws authorizing members to form branches in the localities where they may reside; that rules should be drawn up for such branches, giving them certain duties to perform for the betterment of our association, and

"Be it further resolved, That this resolution be given due consideration, and some action taken at this convention.

"In regard to certificates we have nothing further to add to what we have already written the secretary under date of February 2, this year.

"With best wishes for a successful convention, from the Newport branch.

"Frederic Carter, Secretary."

In the discussion which followed the reading of this letter, it was generally agreed that local branches would be of material aid to the progress of the association and the profession it represents, if the interest could be secured among local members which is not now shown. The suggestion that an article be added to the By-Laws could not be acted on, as the By-Laws provide that an amendment must be published ten days before the annual meeting. It was pointed out that Newport and St. Louis have their local branches and similar branches can be organized elsewhere without special provision in the By-Laws. It was proposed that the president appoint a committee to draw up a set of rules by which local branches could be guided.

Communications were received from Charles Milburn, New York, and J. E. W. Shaw, British Columbia, proposing that a button be adopted by the association, but as at other conventions, this suggestion did not meet with favor, especially at this time, as the cost would make it prohibitive to supply a button to each member.

The following resolution was adopted on the National Botanical Garden.

Be it Resolved, That the National Association of Gardeners at their convention assembled at St. Louis, recommend and support the pending bill authorizing the Commission of Fine Arts to establish a representative botanical garden at Mount Hamilton, Washington, D. C., copies of this resolution to be sent to the representatives of Congress and Senate, to the Chairman of the Commission of Fine Arts, and spread upon the minutes of this convention.

AMENDMENTS TO THE BY-LAWS

The amendments to the By-Laws, which follow, were submitted to the convention to be acted upon:

To amend Article 2, by adding two sections (Section 7 and Section 8) as follows:

Section 7. Applicants for active or associate membership shall be passed on by a membership committee to consist of the secretary and any two members of the executive board, on whom the secretary shall be authorized to call, to pass on applications. An applicant for active membership must provide the membership committee with a complete record of his gardening experience and references as provided for on the application blanks.

Section 8. The Executive Board, or its authorized committee, shall have the power of refusing to admit an applicant to membership, and shall be empowered to expel from membership any one guilty of unprofessional conduct or other conduct, calculated to reflect adversely on the association. The executive board shall be under no compulsion to give any reason for its action in refusing an applicant to, or expelling a member from the association, either to the individual concerned or to the association.

To amend Article 3, Section 1, by making the dues \$5.00 a year instead of \$3.00 a year as now provided.

To amend Article 3, Section 3, by making dues for life membership \$50 in place of \$25 as now provided.

A communication was received from the Cleveland Horticultural Society, protesting against the amendment of Article 2, Sections 7 and 8, as being too drastic and autocratic.

The proposed Section 8 to Article 2 met with much opposition from the floor as giving a member no appeal from the decision of the executive board. It was contended that a member should have the right to appeal to the association against the findings of the executive board. George McMahon, Iowa, directed attention to the By-Laws, Article 5, Section 5, " * * * and all acts of the board, which in its judgment are for the welfare of the association, shall be considered binding."

On motion by J. Baxter, Illinois, Section 7 to Article 2 was adopted as proposed, and Section 8 to Article 2 was adopted, modified as follows:

Section 8. The executive board or its authorized committee, shall have the power of refusing to admit an applicant to membership, and shall be empowered to expel from membership any one guilty of unprofessional conduct, calculated to reflect adversely on the association.

On motion by A. Bieschke, Connecticut, the amendments to Article 3, Sections 1 and 3, were adopted.

There was no opposition to the proposed amendments to Article 3, Sections 1 and 3, that the annual dues be increased from three to five dollars, and that life membership dues be increased from twenty-five to fifty dollars. The advance in annual dues was accepted as the most practical solution for providing the required fund to meet the expenses of maintaining the activities of the association, which will eliminate the necessity of a special fund and thus create an equal taxation on all members. It was further proposed that members directly benefited by the Service Bureau should contribute a certain percentage of their first month's salary to aid in defraying the operating expenses of the Service Bureau.

New York Selected for 1921 Convention

In consideration of the next meeting place, P. W. Popp, of New York, called to the minds of the St. Louis and other western members, that in 1917 the Easterners traveled West to attend the convention in Chicago, and expected to carry the convention back East with them for the following year. They had to content themselves, however, that Cleveland was on the way East when that city was designated for the 1918 convention. Owing to the war, the 1918 convention was postponed and Cleveland had the convention in 1919. New York was the slogan for 1920, but the Easterners found the St. Louisans so full of enthusiasm over what would occur if the convention went to St. Louis that they did not have the courage to bid against them. But, said Mr. Popp, I come from New York with courage to boost for the East for 1921, and it must be New York or bust. You cannot get us to Pike's Peak next year. Mr. Popp found no opposition, and New York, it was unanimously voted, was the choice for the 1921 convention, with the assurance of many of the western members that a large attendance from the West can be anticipated.

The meeting then adjourned, President Jensen announcing that the morning session would convene promptly at nine o'clock.

WEDNESDAY MORNING SESSION

The Wednesday morning session was called to order by President Jensen, who introduced Hon. Fred W. Pape, of the Park Commission of St. Louis. Mr. Pape spoke of the splendid park system of the city he represented, describing many of the horticultural features, and of the part public parks assumed in molding the lives of the citizens who frequent them. The welfare department, he explained, is also an important factor of the St. Louis park system as much attention is devoted to playgrounds, swimming pools, athletics, and other outdoor recreations, all of which tend to popularize the parks. Mr. Pape, who is a horticulturist by profession, remained as an interested attendant during the morning session, participating in some of the later discussions.

The Nomination of Officers

W. N. Craig, Brookline, Mass., who has remained quite prominent in the affairs of the association ever since he held the office of president in 1916, was the unanimous choice of the convention for president for 1921, which will be the tenth anniversary of the association. The nomination came to Mr. Craig as a reward for his untiring efforts to elevate the profession of gardening to the standing which it merits.

The other nominations for officers of the association were made in the order following without opposition: Vice-president, George H. Pring, St. Louis, Mo.; secretary, M. C. Ebel, New York, N. Y.; treasurer, Peter Duff, Orange, N. J.

The trustees for 1921: William Waite, Arthur Smith, D. L. Mackintosh, New Jersey; L. P. Jensen, Ernst Strehle, Missouri.

Examinations for and Classification of Gardeners

Papers were received on the subject of Examinations for and Classification of Gardeners from the Newport branch of the National Association of Gardeners, Arthur Smith, New Jersey, and J. Baxter, representing some of the members from Lake Forest, Illinois. They were submitted in accordance with the recommendations of the Cleveland convention, last year, where this question was brought up for discussion, when, after considerable debating, it was referred to the 1920 convention for final action, and the secretary instructed to invite those who advocated examinations for and classification of gardeners to submit some definite plans. This question again aroused an animated discussion with many divided opinions on the practicability of providing examinations and classifications at the present time, which would fill the different requirements of the wide area of this country, whose climatic and cultural conditions are so variable.

The Newport branch and Arthur Smith had a number of suggestions and recommendations to offer, though nothing tangible in the way of an operating plan. Mr. Baxter's paper did not favor the proposition as it considered the proposition impracticable

and generally non-feasible. The discussion drew forth expressions of opinion from members from different parts of the country, which was very desirable on a subject of such interest as this is to the profession at large, among whom were G. McMahon, Des Moines, Iowa; C. B. Wolf, Hibbing, Minn.; J. Meisenbacher, Tulsa, Okla.; A. Koch, Chicago; J. Baxter, Lake Forest, Ill.; D. Shepherd, Duluth, Minn.; Peter Duff, Orange, N. J.; A. Bieschke, Noroton, Conn.; Montague Free, Brooklyn, N. Y.; G. H. Pring, and H. C. Irish, St. Louis.

The argument which had a decided influence in bringing about a decision, was the potent fact that the association is in no financial condition to undertake such a project at present, which would involve a vast expenditure in its organization without consideration of the cost of carrying it on.

The recommendation which follows was presented by the St. Louis Association of Gardeners and was adopted by a unanimous vote of the convention.

The paramount issue before the gardeners of this country is the question of the N. A. G. going on record as a national organization to examine gardeners to ascertain whether or not they are capable of the professional name gardener.

The western members unanimously welcome the proposal of segregating the gardener from that of the pseudo-gardener. Whatever method is adopted we insist that it should be along American lines, that is, to fit American horticulture not that of European horticulture. The men following the profession are cosmopolitan, embracing men from various parts of the world, who have deviated from the old school to that of specialization, be it Chrysanthemums, Carnations, Roses, Orchids, Propagation, Landscape or any other branch of the allied profession which he has become expert with.

The Royal Horticultural Society of England has been repeatedly quoted as a criterion for the N. A. G. to follow. We, however, do not agree with our eastern members on this point in view of the fact that this organization must embrace North, South, East and West, covering conditions entirely different from that of the Royal Horticultural Society of England. For example: an examination can be drawn up in London that will practically be the same for all England. Is it feasible for the New York office to prepare an examination to fit the South or West? The point that we wish to emphasize is that this question is not for the New York office to carry out only in a directing capacity. Examinations that will fit the eastern conditions will not be appropriate to the western or southern conditions, or vice versa.

This vital question should be well planned to embrace the varied climatic conditions throughout the country including all men following the profession as well as the private estate gardeners. It is plainly manifested to us Western gardeners that the examinations should be under the directing head of the N. A. G., but the subjects of the examination should be left to the local societies throughout the country who will examine in accord with the purely local conditions, etc. If the local societies are insufficient at the present time to assist in this movement, it is, therefore, a fallacy to pile more work upon the secretary of this association. Gentlemen, the N. A. G. has not reached that high standard of efficiency in finance and membership to warrant handling this movement. The matter was postponed from the Cleveland Convention until a definite plan was submitted. The Saint Louis Association has called many executive meetings to arrange a definite plan. We perused the CHRONICLE repeatedly to ascertain if the other local societies have voiced a definite plan. We have read with interest the remarks of the Newport members and Arthur Smith's article relative to gardeners' certificates; however, we have not noticed a definite plan offered to assist the matter when brought upon the floor of the convention. That in itself suggests that the national body is not strong enough to carry the project through to success at this period.

We, the St. Louis Association of Gardeners, recommend that a census of its members should be taken definitely stating their training, whether college or garden trained—subjects studied as: Insects, Diseases and Their Control, Soils and Fertilizers, Experience in Plant Growing, Exotic or Landscape, etc., Positions Held—Past and Present, Salary of Present Position. A census of all the members in the hands of the New York office would enable the directors through the secretary to grade all the gardeners belonging to the national body into classes according to experience.

Inducements for Young Men to Take up the Gardening Profession

The difficulty to secure American boys who will take up the profession of gardening seemed the main point of contention when this subject was presented. It was shown, however, that the association has had ample evidence that a sufficient number of boys can be interested to supply all the demands which will arise, for training them. As the committee report stated, several estates are ready to furnish the necessary facilities, and the owners of

others have signified their intentions of doing so. The lack of interest on the part of the gardeners themselves, to attract the young men to the profession was said to be the greatest handicap to the success of this movement, but it was hoped that as the plans develop further, this apathy will disappear.

P. F. Foley, of Chicago, referred to an orphanage of a fraternal society located in Illinois, which teaches the vocation of floriculture, both under glass and outdoors, to the boys, and suggested that this institution might prove an excellent source of supply for apprentices when the boys are old enough to be sent forth into the world. On motion the secretary was instructed to communicate with the officials of this institution, and advise them of the plans of the association for training young men.

On the recommendation of secretary Ebel, George H. Pring and Montague Free were appointed a committee to co-operate with him in conducting the work of placing young men in positions where they will receive the necessary training to fit them for the profession.

The meeting adjourned to convene at two o'clock in the afternoon.

WEDNESDAY AFTERNOON SESSION

The Wednesday afternoon session convened promptly to discuss the several papers presented to it for consideration.

The Threatened Food Crisis: How Can the Gardeners and Their Association Assist in Relieving It?

W. N. Craig—after reviewing the 1920 food production situation, the present-day tribulations of the farmers, owing to farm labor shortage, high cost of farm machinery, increased freight rates, and poor market facilities; and the returns of the 1920 census, showing a steady trend of the rural population to the cities—professed that he is not over optimistic on the food outlook for 1921. Reverting to the gardeners, and what can be accomplished by home gardens in relieving the food situation, Mr. Craig continued; too many gardeners, sometimes good practical men at that, are obsessed with the idea that now that the World War is ended conditions will speedily right themselves and they can drop back into the even tenor of their ways. I yield to none in my sincere regard for all that is artistic and beautiful in our profession, and am glad to see the floricultural end coming back into its own gradually, but we are not by any means out of the woods, and cannot afford to drift back into pre-war conditions. I consider it to be still the bounden duty of every practical gardener to produce every ounce of food he can, even if some neglect to the purely ornamental is unavoidable. Thoughtful employers realize better than many of their gardeners how necessary it is to keep up food production, and with the increased freight rates it is more than ever your duty to relieve transportation as much as possible by producing all we can at home.

No one loves ornamental horticulture more than I do, but it is unpatriotic and selfish to neglect the utilitarian as too many are doing today. The "back to the farm" movement, "a consummation devoutly to be wished" is traveling via the garden many a way. Many have planted a garden; liked the sample of crop growing which it gave, and wanted more. Then they started dreaming of a small farm. For some, dreams have come true and may their number steadily increase! There is nothing more likely to cure a man of any Bolshevistic tendency which may lurk in his system than a garden or farm to care for.

It has been truly said that it is not really a home unless there is a garden of some size attached to it. Without a garden 'tis merely a house in which people dwell for a longer or shorter period. The very word "home" indicates, it seems to me, contented parents, happy children, household pets, and gardens where vegetables and flowers are grown. The garden ties the home to the land, and what our country needs is more tying of this kind.

More gardening through so called "war gardens" and now considered as home gardens, has been done in the past few years than ever before. Much of it started as a patriotic duty, but many continue it as they enjoy it and find it both pleasant and profitable to do so. Not a few took gardening up as a mere fad and now cling to it as a well-worth-while fact. It is in the power of the members of our association to support in every conceivable way this home garden and "back to the farm" movement. We cannot afford to have it linger and die.

If the cost of living is to come down, we must produce more, and urge others to do likewise. We need more producers and not an increasing army of non-producers and consumers, in addition to more up-to-date marketing methods. There are probably some who will consider the danger of any near food shortage as very unlikely, but decreased crop acreage will result from low prices to the farmer, and a single poor harvest may bring dire disaster to multitudes. Without seeking to be at all pessimistic, I would urge continued and careful attention to food production on every gardener as a strictly patriotic duty.

In the general discussion Mr. Craig's views were upheld.

Will the Farmerettes Solve the Problem of Help Shortage on Country Estates?

There was no dissension in the views entertained on the part which the farmerettes have performed on country estates in alleviating to some extent the help shortage during and since the war. It was agreed by those in a position to observe the work of the farmerettes that in most instances they were highly efficient, taking a keen interest in whatever duties were assigned to them, and usually were found to be steady workers. However, it was not believed that the young women who engage in this work do so with any idea of permanency, but that they go into the gardens to gain practical experience which will assist them later, combined with their theoretical training, to become instructors or designers, or to embark in one of the many departments of commercial horticulture. That the employment of farmerettes on country estates will solve the problem of help shortage was not generally affirmed.

Mr. Ebel suggested that there should be a distinction between the young women working in gardens and those working on the farms, known as farmerettes, and proposed the name gardenette to designate the garden workers.

A motion was carried to submit the name gardenette to the Woman's National Farm and Garden Association, which was recognized as the national organization representing the women who are engaged in gardens and on farms, for its approval.

The Sign Board Nuisance Defacing Our Highways: How Can It Be Combated Effectively?

Mr. Ebel submitted a paper to the convention on the sign board nuisance, in which he said:

The National Association of Gardeners has been requested by one of its sustaining members, Mrs. Samuel Sloan, a prominent country estate owner of New York, and vice-president of the Garden Club of America, to enter its protest at its convention against the sign board nuisance which is causing the despoliation of the landscape views along our highways.

The desecration of our highways by unsightly sign boards is assuming the form of a real menace, and unless some united action is taken on the part of all organizations and individuals concerned in seeing the handiwork of Nature conserved along our highways, the sign board interests will soon obscure it.

Legislation, we are firmly convinced, will avail of little, for while it may be possible to regulate the use of property along the roadway, it will be difficult to regulate what a property owner may do fifty or more feet removed from the roadside, especially outside of city and suburban limits where local ordinances do not control conditions. Our grievance, however, is against the defacement of our highways. There are already many statutes in many states to regulate bill boards and sign boards, but few seem effective, judging by the encroachments the sign boards have made the past few years.

The most effective weapon to employ to combat the sign board nuisance is to create a public sentiment that will discourage our national advertisers from using sign boards along our highways; and this method will be far easier than to attempt to secure laws which would meet the opposition of the sign board interests who have millions of dollars invested in their enterprise.

Public sentiment is not in favor of sign boards marring the natural beauties along our highways. With the greater interest manifested in country life, and the more extensive use of the highways by the automobilist, opposition to the sign boards, if once stirred, will be greater than it has ever been.

As an aroused public opinion, supported by the "power of the press," no doubt, is the most feasible means of curbing the sign board nuisance, and thereby conserving the natural beauties along our highways, I recommend that our association take the initiative to create a nation-wide agitation to cause the abolishment of the use of the sign boards through a thoroughly organized movement, and that all interested organizations be invited to co-operate in such a movement.

After some discussion, which was all in opposition to the sign board nuisance, the following resolution was adopted:

Whereas, it has become quite evident that if the sign board interests are permitted to continue unmolested they will soon succeed in the despoliation of the beauties of the natural scenery along our highways,

Therefore, be it resolved, that the National Association of Gardeners take the initiative to institute a country-wide propaganda to arouse an indignant public sentiment against the sign board interests and certain national advertisers who are with unsightly sign boards defacing the landscape views along our highways, and

Be it further resolved, that the National Association of Gardeners invites all other organizations, interested in having the natural scenery along the country's highways protected and conserved, to co-operate with it in suppressing the sign board vandalism.

President Jensen next announced that the meeting would adjourn and the members proceed to the Missouri Botanical Garden where they would be guests at the annual Shaw Banquet.

THURSDAY MORNING SESSION Election of Officers

As there were no opposing candidates for the offices for 1921, a motion was made that the secretary cast the ballot for their election. President Jensen then made the announcement that the following officers were elected to serve during the year 1921: President, W. N. Craig, Brookline, Mass.; vice-president, George H. Pring, St. Louis, Mo.; secretary, M. C. Ebel, New York, N. Y.; treasurer, Peter Duff, Orange, N. J.

Trustees for 1921: William Waite, Arthur Smith, D. L. Mackintosh, New Jersey; L. P. Jensen, Ernst Strehle, Missouri.

J. Horace McFarland on Quarantine 37.

I presume I cannot add to your information about Quarantine Bill No. 37, and I certainly do not want to add to your distress by talking too long on the subject of how Quarantine is to be handled. A great deal of discussion has been had over the meeting called in New York in June, which included mostly the men and women who had suffered by the drastic application of Quarantine 37 in the consumption of plants, rather than in the sale. It was called by the Massachusetts Horticultural Society, the Horticultural Society of New York and the Pennsylvania Horticultural Society; the presidents of which organizations called together the representatives from over thirty or forty of the National organizations and local organizations, and a very remarkable fact was that the principle of the Quarantine was approved; i. e., the necessity for the Quarantine against additional bugs, etc., was fully recognized, and all of the discussion was in the direction of securing modification of the quarantine, so that while the Nation may be completely protected against the introduction of new plant diseases, insects, etc., there might yet be that world exchange in the horticultural business which has made gardening in America so great. It was pointed out, for example, that if all the plant life now in this country had been restricted to plants of America originally, there would not be any peonies, and there would not be a number of other beautiful flowers we look at today in some of the wonderful gardens in this country.

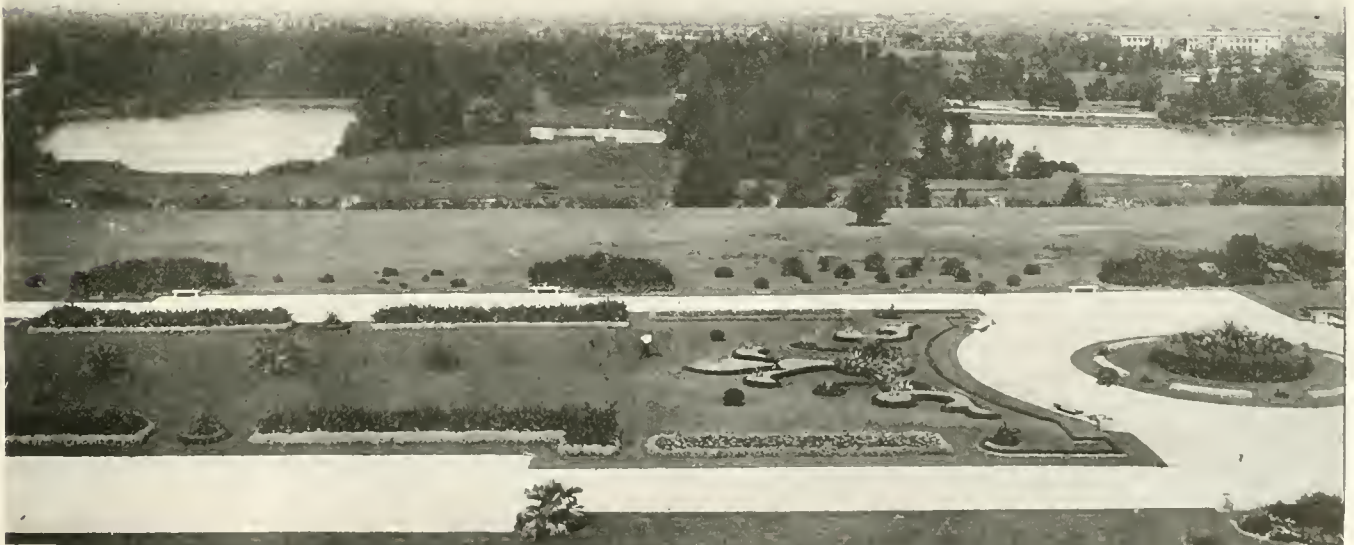
I am sure from personal knowledge that there is no disposition in the minds of the members of the Horticultural Board to so work this quarantine as to exclude definitely the forwarding of plants from abroad. This body is made up of able men for whom I have profound respect: like most men who are devoted to one thing, the thing they are devoted to is the biggest thing in the world to them. A pathologist dealing in horticulture or floriculture with plant insects and diseases does not see the plant. As I say, I like the members of this Horticultural Board, but I am

going to tell what I know to be a fact; I believe if you had them here and took them to the Missouri Botanical Garden, put them in the midst of that wonderful exhibit, none of them would know anything about the propagation of those wonderful plants. Can we put the life of the plant in the hands of idealists in the Federal Horticultural Board?

Now very great harm has been done by calling these men names. In one particular instance, the abuse of the Federal Horticultural Board has hurt the whole situation almost beyond relief. I know Dr. Marlatt and every member personally, and have absolute confidence in every one of them; it doesn't help the situation to call them names, and inasmuch as they are becoming more interested in the situation, they are worthy of the confidence of the N. A. G. They are excellent men of good ideals, and we must recognize, gentlemen, that they are not all alike, any more than we are all alike.

Our committee wants to get evidence to present to the Federal Horticultural Board to bring about a modification of the provisions of Quarantine 37. The committee was instructed to get evidence, it was not told to get hot air; you cannot take hot air into court and get anything with it. It is really a case in court, that is, a case supported by evidence that we are trying to make. I am very glad to have this opportunity of asking you to send Mr. Ebel any specific evidence you have of the operation of Quarantine 37 which has definitely worked damage to plants, trees, vines, shrubs, etc. It is evidence we want of the hardship endured rather than opinions. Inferences do not get us anything. Specific statements will be of the utmost value. I have the hope that you with your wide reach will unearth testimony for us. The purpose I have in mind has been accepted by the Horticultural Board, and Dr. Marlatt has promised a meeting of that Board and has promised that whatever we can show will be considered, and our suggestions taken into favorable account without prejudice, i. e., he has agreed that if we can show hardship and wrong that he will ask a remedy for the hardship and wrong.

It has occurred to me that one of the worst things that has happened in connection with Quarantine is the practical prohibition of importation by great botanical gardens. It would be folly to tell those interested what has been done by the Missouri Botanical Garden, the Arnold Arboretum, Brooklyn Botanical Garden, New York Botanical Garden, etc., for the promotion of plant life. You all know what they have done. You do not want them stopped doing their work in these directions. While they understand that theoretically they can import, practically they cannot, and importations in consequence have practically ceased. Prof. Sargent, of the Arnold Arboretum, told me personally that the wonderful work of that institution has been handicapped in so far as investigating plants outside of America has been concerned. E. H. Wilson is now in Australia, and he will undoubtedly soon have ready for sending into the United States a great collection of plants, some of which will be very useful. It is



Panorama view of the World's Fair Grounds, showing the city in the distance, taken from the hill side of Forest Park, St. Louis, where the members of the National Association of Gardeners attending the convention, were entertained at a barbecue by the St. Louis Park Department Association

hoped that the situation will be modified so that importations may be made. Perhaps it might be arranged for these institutions to separately import plants, etc., by arrangement with the Horticultural Board, upon their guarantee to guard against any new bugs or diseases. These great institutions should be permitted to continue their collections of plants.

I hope you will take some action in support of this idea, not of fighting quarantine, but of having quarantine sanely administered with reasonable consideration.

M. C. Ebel offered the following resolution, which was unanimously adopted:

WHEREAS, The National Association of Gardeners in convention assembled has witnessed the beneficent and notable work accomplished and being continued by the Missouri Botanical Garden, which in common with the Arnold Arboretum, the New York Botanical Garden, the Brooklyn Botanical Garden and similar institutions, has brought to notice after adequate testing many important plants, shrubs and trees of notable value, and whereas under the practical operation of Quarantine 37 declared by the Federal Horticultural Board further additions to the flora of America of plants from abroad are made virtually impracticable, and whereas the National Gardeners' Association, while recognizing the necessity and value of a reasonably administered quarantine against the introduction of insects and diseases injurious to plants, feels that the great educational institutions of America should not be checked in their important work with plants,

THEREFORE, BE IT RESOLVED, That we urge the Federal Horticultural Board to so arrange its regulations under Quarantine 37 as to permit the resumption of plant importations by the Missouri Botanical Gardens and similar educational institutions upon guarantees from such institutions to so inspect and treat such importations as to allow no new insects and diseases to be disseminated.

Executive Meeting

An executive meeting of the trustees and directors was held at the Hotel Marquette, Tuesday morning, at ten o'clock, at which the business presented for the board's consideration and to be acted upon, was disposed of, and the secretary's financial statement and the treasurer's report were audited.

(Owing to a misunderstanding with the reporter of the meeting, who gained the impression that the copy of the convention report was not required immediately, and proceeded to a convention in another city, before transcribing the notes for the gardeners' convention, the above report of the meetings had to be compiled from the secretary's recollection of the proceedings in order that the publication of the GARDENERS' CHRONICLE would not be delayed any longer. If there have been omissions of importance they will be reported in the November issue.)

THE CONVENTION ENTERTAINMENT FEATURES

When the delegates arrived at the convention city on Monday evening, they found the arrangements committee awaiting them at Union Station to escort them to their hotels, and to announce to them that the program of the business meetings would be carried out strictly according to the schedule, and that the sessions would open each day promptly at the hour set. The members were requested to be punctual in their attendance so that the important business, which was to come before the convention might be properly disposed of.

It was not expected, however, that the entertainment committee would be as exacting in the carrying out of its program but it was none the less so with the result that there was not a flaw in either the business or social functions of the convention and the various committees, which comprised the professional gardeners, the staff of the Missouri Botanical Garden, the Park Department, the commercial growers, and the retail florists, not omitting the women's auxiliary, showed that by harmonious team work the usual delays in convening convention meetings and in the entertainment, can be wholly avoided.

On Tuesday and Wednesday mornings the women's committee, composed of Mesdames Jensen, Pring, Rowe, Strehle, Baumann and Gerney, met promptly at the hotel headquarters at ten o'clock to take charge of the women delegates to the convention. These two days were devoted to automobile tours along the Mississippi River, to Jefferson Barracks, Grant's Farm, the old birthplace of General Grant and now the country estate of August A. Busch, through the foot hills of the Ozark Mountains, and other points of interest in the surrounding country, with luncheon parties at the country clubs, returning to the hotel in the evening at the hour at which the business sessions adjourned.

The general entertainment provided for an illustrated lecture on "Rock Gardens," by Montague Free of the Brooklyn Botanical Garden, Brooklyn, N. Y., which was given in the ball room of the hotel, and was appreciated by the large assemblage present. After the lecture, the St. Louis Gardeners' Association tendered a reception to the visitors, followed by a dance in which the

younger folks participated, while the older folks were gathered at the tables arranged along the sides of the ball room, and enjoyed the refreshments.

After the adjournment of the business session at five o'clock on Wednesday, President Jensen announced that the Shaw Banquet, at which the members of the National Association of Gardeners were to be guests, would be held in the Floral Display House at seven o'clock, and that all were requested to be at the Botanical Garden. Promptly at the hour named the doors were opened and the guests escorted to their places at the tables. The banquet was a most unique affair, with the setting of the climbing and many tropical plants along the sides of the house, giving an appearance of a tropical garden, as the picture produced on another page illustrates. It was the first time that any banquet had ever been held, as far as was known to any one present, in a house of this kind, and the first time in the history of the Shaw banquet that women had attended. It has always been customary to hold the annual Shaw Banquet in one of the hotels, but the idea suggested itself to Dr. Moore, Director of the Missouri Botanical Garden, that the Display House would be the most appropriate setting with the visiting gardeners as guests this year. An excellent orchestra furnished music, while a no less excellent menu was being served.

When the inner man had been satisfied, Dr. Moore announced that as the supply of after dinner speakers is no longer as abundant as it has been in the past, he would omit the time honored custom of having after dinner speeches by limiting it to a few remarks from M. C. Ebel, Secretary of the National Association of Gardeners. Dr. Moore then called on Dr. Herman von Shrenk, who entertained the guests with a most interesting illustrated lecture on "The Trees of the Pacific Coast." After the lecture the dinner guests walked through the Garden to Tower Grove Park, where they viewed the illuminated aquatics.

Precisely at the hour of eleven on Thursday morning a procession of thirty odd automobiles, furnished by the horticultural interests, started from the library square for a tour of the city and inspection of the country estates and park systems. The freedom of the city was the visitors' for the day, for at every traffic point until five in the afternoon, when the tour terminated, police were stationed to give the right of way to the line of cars. At noon the party became the guest of the St. Louis Garden Club at Bevo Mill, where it was greeted by Dr. von Shrenk, the President of the Club. Montague Free of New York responded for the members of the association. From Bevo Mill the automobiles proceeded to the Missouri Botanical Garden, and from there the tour of the parks was continued, ending at Forest Park at five o'clock, where the party became the guest of the St. Louis Park Department Association. An old-fashioned barbecue was the form of entertainment planned for that evening. The Park Department had declared a holiday to permit the employees to attend the picnic in honor of the visiting gardeners, at which it was estimated some twelve hundred people attended.

Too much credit cannot be given to the various committees of which G. H. Pring, E. Strehle, H. C. Irish, L. Baumann, Hugo Schaff and J. Moritz were the respective chairmen.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring thoroughly competent gardeners—in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for.

The Association seeks the co-operation of country estate owners in its endeavor to establish a reliable source to which they can apply with every confidence to secure the services of gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve, or to the member it may benefit.

Those desiring to avail themselves of the services of this Bureau should apply to—

M. C. EBEL, Secretary
National Association of Gardeners,
MADISON, N. J.



An Opportunity for Orchid Buyers

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Is Ours To Sell—And Yours To Buy!

Here, indeed, is a rare opportunity for all who love the orchid—flower of fascination for the amateur or grower.

If you know orchids at all,—either for pleasure or for profit—you know of the wonderful collection of Clement Moore.

For a quarter of a century Mr. Moore has gathered, from every known source, the very cream of the stocks of growers and hybridizers of the wonder-flower.

In addition to the wonderful things he has obtained, there are the results of his own many years of most careful hybridizing.

So that altogether, there are some

**500 RARE AND EXCLUSIVE
SPECIES AND HYBRIDS.**

This famous collection, then, is one of the greatest ever got together anywhere, *and unquestionably the*

greatest opportunity ever offered to orchid lovers and orchid growers in this country, to add to their stocks.

Mr. Moore's fancy ran particularly to Cattleyas, so that among these especially, are there rare finds to be had.

As an example of some of the things we have to offer you, in this great collection, there are in bud and sheath the following:

- 400 Cattleya Labiata
- 100 Cattleya Fabia alba (Cattleya Labiata X C. Aurea)
- 200 Cattleya Ballantineana (Cattleya Triana X C. Gigas)

You know how long it takes to get a Cattleya Hybrid to flower. Getting these, you save many years.

Send To-day for Complete Price List and Descriptions.

Of course, there is not room to begin to describe here the scores of rare and choice plants—many never in commerce. If you are interested you will send at once for our complete list, with prices.

The plants themselves may be seen or bought at Hackensack, N. J., on dropping us a line to make an appointment.

From the inquiries we've had since the news leaked out that Roehrs had the disposal of this unsurpassed collections, we would suggest your acting promptly. That is, if you wish the advantage of selecting from the full range.

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AMONG THE GARDENERS

George Thomson, recently superintendent of the R. J. Collier estate, Wickatunk, N. J., has accepted the position of superintendent of Shadow Lawn, the estate of Hubert T. Parson, West End, N. J.

Andrew Anderson secured the position of superintendent of the estate of H. B. Mebane, Great Falls, S. C.

John F. Proctor secured the position of superintendent on the E. S. Bayer estate, Mt. Kisco, N. Y.

Alexander MacKenzie resigned his position on the Waterbury estate, Smithtown, L. I., to accept the position of superintendent on the J. D. Maguire estate, Locust Valley, L. I.

H. A. Brown secured the position of gardener to Steven Birch, Mahwah, N. J.

A. E. Thatcher secured the position of superintendent of the W. R. Coe estate, Oyster Bay, L. I., succeeding Thomas Proctor who recently resigned.

Robert Budd accepted the position of gardener to H. T. Bradner, Gates Mill, Ohio.

THE AMERICAN DAHLIA SOCIETY SHOW

Even the most sanguine of the American Dahlia Show promoters could not have been disappointed when the doors to the roof of the Pennsylvania Hotel opened on September 27 to permit the visitors to view the annual exhibit of that society.

The sight of the numerous exhibits by professional and amateur gardeners and commercial growers, of dahlias in their many forms and myriad colors, was one seldom beheld even at a flower show, and one can no longer deny the claim of dahlia enthusiasts that it has become one of the favorites of the American gardens.

The silver vase offered by the GARDENERS' CHRONICLE for the most meritorious exhibit by an amateur grower was won by Mrs. Charles H. Stout, Short Hills, N. J., and the silver medal of the National Association of Gardeners, offered for the most meritorious exhibit by a professional gardener, was won by Oscar Carlson, gardener to Miss A. B. Jennings, Fairfield, Conn.

Among the commercial exhibits, the collection staged by W. Atlee Burpee Co. was easily the most attractive one, and was awarded the society's gold medal for the best general commercial exhibit.

The Judge Marean collection of dahlias, staged by John Scheepers, Inc., was undoubtedly the outstanding feature of the show. The size and beauty of the flowers and the manner in which they were staged, in large baskets and bases against a background of purple velvet, made a gorgeous display. It was awarded a gold medal.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Here and There

THE DARWIN TULIP.

Much of the adverse criticism of the early Tulips is due to the preponderance among them of gaudy or harsh colors which do

King GREENHOUSES

Are extremely popular among gardeners who take pride in having the best showing of flowers and vegetables.

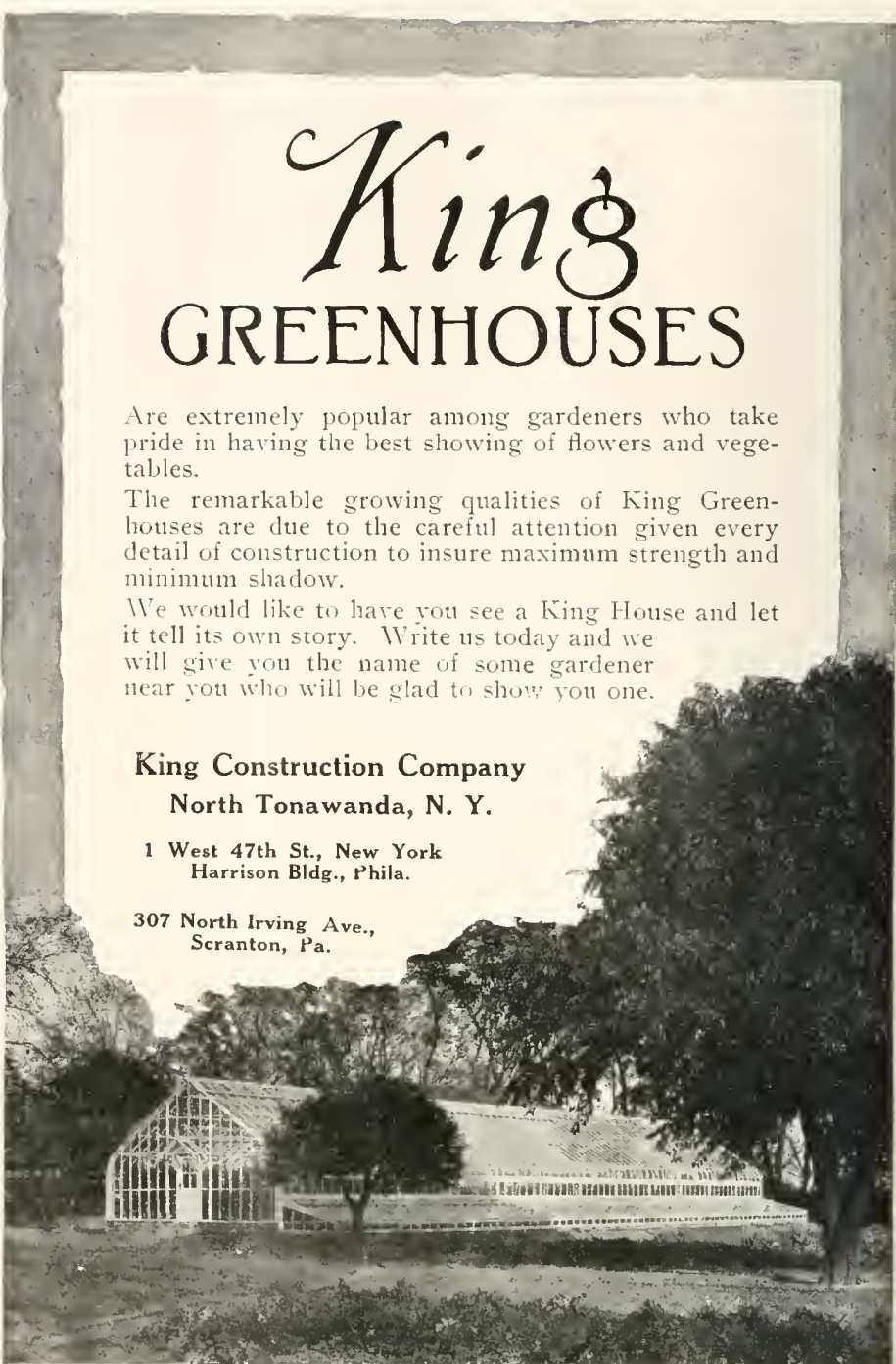
The remarkable growing qualities of King Greenhouses are due to the careful attention given every detail of construction to insure maximum strength and minimum shadow.

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not harmonize with the surrounding landscape.

Quite different are the Darwins with their rich tints including various shades of heliotrope, mauve, salmon-pink, maroon and deep crimson. The large flowers, which appear in May, are borne on strong stems two to two and a half feet high, and placed well above the foliage. If the flowers are cut as soon as they open, they will develop to perfection in the house, and last many days.

The culture of these Tulip is very simple. The bulbs should be planted during October or November in soil that has been previously enriched, placing them five to six inches deep and about four inches apart. No further care is required except the application of a cover after the ground has begun to freeze, and the removal of the cover in early Spring. This cover may consist of coarse stable manure, or a layer of leaves, the object being to prevent alternate freezing and thawing in the Tulip bed, a

condition which would disturb the roots at the base of the bulb.

When the blooming period is over, the bulbs are allowed to mature, a condition indicated by the yellowing of the leaves. They are then taken up and allowed to dry in the sun for a few days, after which they may be put away in a dry place to await re-planting in the Fall. Or, if preferred, the bulbs may remain undisturbed and shallow, rooted annuals planted over them, care being taken to avoid injuring the bulbs while using the trowel.—*Flower Grower.*

GLADIOLUS PRIMULINUS

Since the days of its introduction, in 1890, the quaint hooded form of this species and its dominance in most of the hybrids, has always aroused differences of opinion. The æsthetic have always seen charm and beauty in this peculiar hooding coupled as it is, with pale primrose color. The genus

DREER'S

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A copy mailed free to anyone mentioning this publication.

HENRY A. DREER 714-716 CHESTNUT STREET.
PHILADELPHIA, - PA.



Gladiolus had never been rich in yellow shades, for until the discovery of *L. primulinus*, only about half a dozen yellow species had been found and these had proved slow in helping the development of a yellow large flowered garden type.

L. primulinus has not materially helped in this direction either, for while its yellow coloring is so potent that it almost always appears among crossbreds, either as a clear shade or intermixed with red, the hooded character, too, is dominant. The same character was noticeable in the old Lemoine type, a strain derived from *purpureo-auratus*. Raisers all over the world have strains of *Primulinus* hybrids, many of them exceedingly lovely and worthy of name, yet for our own part we have always felt we would like to see these glorious orange and other tints in the ordinary type. We scarcely dare use the term *Gandavensis* in these days, for the species and varieties have now become so mixed that the whole bunch of hybrids have apparently got together until no one knows where *Gandavensis*, *Saundersii*, *Childsii*, *Lemoinei*, etc., begin and end.

It was to be expected that size would be developed in the *Primulinus* hybrids and it is in this direction that the aesthetic see decline rather than advance. At the recent Boston show A. Gilchrist, of Toronto exhibited hybrids of *Primulinus* X *America*, which, while retaining the loose habit of the former, had lost the hooded character and yellow tint and partaken of the color, size and open form of the other parent.

That development in this direction is general, is evident by the fact that one of the most noted nurserymen on the other side makes a protest against the spoiling of this charming type. While urging every effort in the direction of new colors, he considers any departure in the matter of size and form a loss, not a gain. The tendency to expand every flower to its utmost limit of size at the expense of balance and form is, he considers, to be deplored.—*Florist Exchange*.

COLD WATER FOR FROZEN PLANTS

An article in *The Fruiterer and Market Grower* on the above subject from the pen of the veteran horticulturist, Mr. W. F. Emptage, reminds me of my own experience. Many years ago I took charge of a garden in Northern France. I was but twenty-two years of age, and considered myself lucky to get such a charge at so early a period of my gardening career. It happened that there came a severe Winter.

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This year I am using it in my garden.

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HAMMOND'S PAINT AND SLUG SHOT WORKS, BEACON, NEW YORK.

One night the thermometer marked 30 degrees of frost. I had made the round of the glasshouses about 2 p. m. and found the temperature all right, but as the frost was increasing I thought I would make sure and go through again about an hour later. Everything was right in the Palm, Camellia, and Orchid houses, but when I came to the house which contained my whole stock of bedding plants I saw, with horror, that the stovehole was half-filled with water; it was evident that the boiler had given out. It may be imagined what my feelings were. I knew that the boiler could be repaired on the following day, for, like nearly all the hot-water boilers then in use in France, it was made of copper, but what could I do to stay the destruction. The thermometer steadily fell until frost entered the house and ultimately 10 degrees of frost were registered, the plants, of course, being frozen as hard as boards. To all appearance the plants were doomed, which meant either a big outlay or denuded flower-beds the following Summer. Suddenly it flashed into my mind that my father once related how he had dealt with a house of frozen plants. Fortunately, it was one of those frosts that do not last throughout the day, and soon after day-break the temperature began to rise. I filled all the water cans and stood, syringe in hand, watching the thermometer, and when it was within a degree of thawing point I thoroughly drenched the house with tank water. This operation I repeated, so that the foliage was covered with moisture until the temperature was 5 degrees above freezing. In all my life I never passed

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a more anxious time, but when the sun rose it shone on a house of plants that showed no trace of having been invaded by frost. Zonal Pelargoniums, Lobelias, Petunias, Verbenas, etc., were as fresh as if the temperature had remained normal all through the night.

Some years ago in this district there came a hard frost in May. The man in charge of a garden where early vegetables were grown happened to wake early and found everything frozen. There being a command of water with stand pipes in the garden he went to work with the hose and thoroughly moistened everything that frost could injure. The result was that his crops were saved, whereas his neighbor's crops were badly hit, the Potatoes being cut down to the ground.

In his article on this subject Mr. Emptage relates that after a very fine day on May 4th there came a sharp frost. He says:

"All my beautiful Potatoes were as white as a sheet; in fact, everything was. I rushed round and got all the hands from the bothy and the others from their homes. Taking two or three 4-gallon cans with big roses upon them I set two men at the big wheel pump. Two or three others I set bringing the water in pails and barrows. I took the can and thoroughly washed out the frost from the Potato haulm. By great exertion I managed to get over all the Potatoes just as the first rays of a brilliant sun began to fall athwart the land. Then we tackled the Lettuce. I made a close examination of the Potatoes after the sun had been on them three or four hours. The result was a fine crop of early Potatoes. This while all my neighbors had their crops cut to the ground. Ever since then I have regarded the coldest water as being the best preventive of frost damage. One year, when operating in Herts, I had all my bedding Geraniums frozen stiff on May 25th and saved them all by washing out the frost in the same manner."

In this way he saved the greater portion of his Chrysanthemums from a September frost. Every plant that was not so treated was rendered useless. Mr. Emptage concludes by saying, "Thus is my own practice justified, and I am more certain than ever that cold water is the best antidote to white or hoar frost." It must be thirty-five years ago that we had a Winter almost the counterpart of the one we have passed through, and we had twenty frosts in the first three weeks in May, all sharp enough to destroy fruit blossom, Pea bloom, and, of course, Potatoes, and I am wondering if history in this respect is going to repeat itself and that we shall have destructive frosts in the month of May. I hope not, but we never can tell what is going to happen in the way of weather vicissitudes. May is a fickle month, and the sharp frosts are pretty sure to follow the fine Summer-like days.—*Gardening Illustrated.*

HARRY BALDWIN

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Joliet, Ill.

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To city folk, over whom the threatened food shortage of next Winter hangs like a black cloud, the various ways in which the New England branch of the Woman's National Farm and Garden Association is bringing producer and consumer together are indeed glad tidings. The national organization numbers about 2500, and dates back seven years. It is the outgrowth of the enthusiasm brought back from England by Mrs. Frances King, of Alma, Michigan, who formed the Association with the help of seven other women equally enthusiastic, and who is still its national president.

One of the most important functions of the New England Farm and Garden Association of which Mrs. Geo. U. Crocker is president, is to help the woman to find an outlet for her eggs, her canned vegetables and her preserved fruit of standardized size and excellence, always encouraging the women to produce the really worth-while things for which there is a ready sale in the cities. In New York there is a travelling exhibit which goes out among the farms and helps to standardize taste in the matter of handiwork, which farm women turn out in great quantities. This idea will probably be used in New England also soon.

The farm and Garden Association is supplying this needed education in exactness, also pointing out to farmers and farmers' wives that in handiwork and in food the quality of the product is of prime importance; that the package or container should have an individuality of its own, and that when both these things are right and the price charged makes due allowance for the fact that the commissions of two or more middlemen are cut out by marketing directly to the consumer, quite a profitable business should result.

Furthering agriculture as a vocation by offering scholarships at State colleges and other horticultural schools, and helping women to secure positions for farm and garden work, once they have been properly trained for such positions, is a very important department of the association's work. A fund is raised for scholarships (living expenses) at the Agricultural College in Amherst, and already there are many applications for help next Winter.

How varied may be the vocational opportunities for which a course at the Massachusetts Agricultural College fits, is shown by some of the positions now being held by girls who have taken such courses. There are professional landscape gardeners and florists, owners and managers of estates, nurseries, poultry plants, dairy plants, truck gardens and orchards, extension service workers in home economics in boys' and girls' clubs, and secretaries and office managers for nurseries and floricultural establishments. An interesting



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new field is that of rural journalism, now on the verge of wide development. Herbert Hoover indorses the association most heartily. "I want to send to you," he writes, "a message of appreciation for accomplishing a task which is both inspiring and valuable. The constant war drain on agricultural employment makes it necessary that production be stimulated by the utilization of new agencies, and I feel that the Woman's National Farm and Garden Association can serve a very useful purpose."

In order to enlarge its scope, however, and meet as effectively as it may, the present critical situation in agriculture, this organization feels that it must double its

membership. It believes that every woman who realizes what food means to the world today, should sign up for at least two dollars' worth of support (one annual membership) and send the same in to the secretary, Mrs. N. F. Conant, at 4 Joy street, immediately.—*Boston Evening Transcript*.

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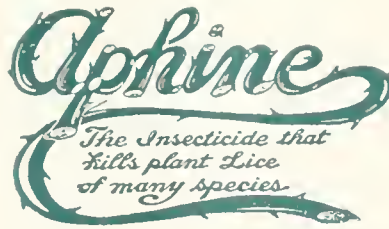


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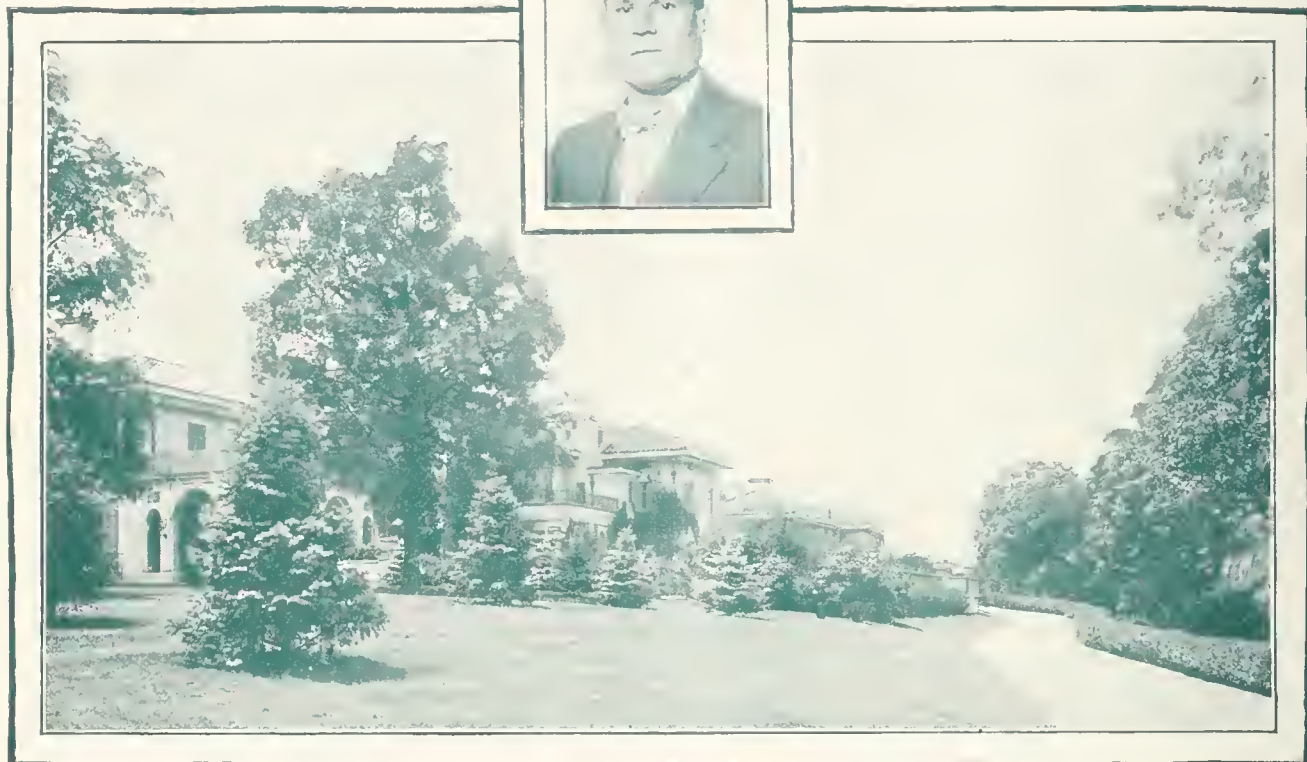
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXIV

NOVEMBER, 1920

No. 11

Things and Thoughts of the Garden

MONTAGUE FREE

IT is pleasurable to notice towards the close of the growing season that many plants revive their energies and commence to bloom again. This is probably due, in part, to better moisture conditions at the roots and to the congeniality of cool nights. Walking around the garden in mid-October many plants, which normally bloom in Spring or early Summer, were noticed having quite a respectable crop of flowers. Amongst them were *Helianthemums* and several species of *Dianthus*, *Campanula* and *Armeria*. It is a fairly common occurrence for fruit trees such as apples and pears to bloom again in the Fall as is evidenced by the almost annual crop of letters to the press from excited amateurs telling of their trees bearing fruit and blossoms at the same time.

We have quite a number of plants whose natural time of blooming is in the Fall and one of the best of these, although it is all too seldom seen in gardens, is *Sedum Sieboldii*. Its gracefully arching stems arise thickly from a central tuft to a height of about nine inches, many of them bending over so as to touch the ground. They are clothed with thick, succulent, glaucous leaves arranged in whorls of threes. This is a plant worth growing for the beauty of form and coloring of its foliage alone, without taking into consideration the bright pink flowers that are freely produced on the tips of the shoots in early October. It is so distinctive a plant that it is well worth while to take measures to protect its blooms from the frosts that are sometimes experienced in October. This can be easily done by throwing some light covering over it, such as heavy wrapping paper, on nights when frost is anticipated, or it may be dug up, potted and brought into a cool greenhouse. Like the rest of the *Sedums* it is quite tolerant of being disturbed at the root, and accepts moderate mutilation with perfect equanimity.

The well-known *Plumbago Larpena*, or, to give it its latest title, *Ceratostigma plumbaginoides*, is another fall bloomer whose bright blue flowers are welcomed during September and October. There are many others that we are grateful to for assisting in brightening the closing of the season, notably the hardy 'Mums and the fall Crocuses.

* * *

The annually recurring glory of the hardwoods in the Fall is a reminder that the suggestions made by "On-looker," about a year ago, relative to the greater use of trees and shrubs prominent for their fall coloring, should be pondered over by those responsible for garden making. It is noteworthy that although much attention is given to the placing of trees and shrubs with reference

to the color of their flowers, the question of effectively grouping them with reference to their leaf coloration in the Fall is often overlooked.

Bright sunshiny weather and cool nights, in other words sharp fluctuations of temperature, seem to be factors which have much to do with increasing the intensity and brilliance of the fall coloring. An instance of low temperatures influencing the production of red coloring in the leaves of plants was noticed during the coal shortage three years ago. The temperature of a greenhouse, containing a collection of succulent plants, which was normally maintained around 50° in the Winter, on a few occasions fell several degrees below freezing point owing to the absence of sufficient fuel for proper heating. Many of the plants thereupon exhibited the characteristic leaf coloring that we associate with the Fall. The plants most affected were *Sedum* and *Echeveria*.

The red color that appears in the leaves of lettuce when newly transplanted outdoors in the Spring has frequently been commented upon. The explanation given of the fall coloring of the leaves of our trees and shrubs is that chlorophyll, the green coloring matter of leaves, is disintegrated by cold and bright sunshine, correlated with the waning vitality of the leaves. This unmasks the yellow pigment that is present in all normal leaves. The presence of sugar and probably tannin in the leaves seems to be a factor in the production of red coloration—the disappearance of the chlorophyll admitting a sufficient intensity of light to produce the proper chemical reaction. Probably a similar explanation may fit the case of transplanted lettuce with the added factor of the shock to the root system which possibly assists in lowering the vitality of the chlorophyll.

The fall coloring of trees in smoky cities is not by any means as brilliant as that to be seen in the country. The presence of a layer of soot and dust on the leaf surface accounts in a large measure for this, and, in addition, injurious gases may so hasten the dying of the leaves once their vitality begins to wane, that they fade away into a series of dingy browns before the true colors have an opportunity to show.

* * *

It seems to be fashionable in ultra-aesthetic circles to decry the use of shrubs having variegated leaves, or foliage of a different hue to the normal green, but most gardeners will, when the surroundings warrant it, sponsor the use of shrubs of this type in gardens. Even the golden leaved privet, which to some people seems

inexpressibly vulgar, is decidedly beautiful when used in the right situation. I have noticed several times during the year a clump of privet bushes in which the green and golden leaved kinds are intermixed. Whether the two forms were planted together or whether some of the branches of the golden leaved form have reverted to type was not determined. These bushes have attained a height of from eight to ten feet and it so happens that the golden leaved branches prevail at the top. When seen from a distance one is given the impression of a flowering shrub of some hitherto undescribed species. The illusion is lost, of course, on closer approach and the effect is not so pleasing, but in many gardens there are situations not subject to close inspection, that could be considerably brightened up by the note of color contributed by this rather commonplace shrub. It has one advantage not possessed by flowering shrubs, namely, that of performing its color giving function throughout the major part of the year.

An instance of the use of a shrub with colored leaves in connection with flowering herbaceous plants was to be seen in the Royal Gardens, Kew, ten or more years ago. In this case a large group, many yards across, of a yellow leaved form of Elderberry was used as a background for a bed containing orange colored *Kniphofias*. This combination was designedly made with the intention that it should be telling from distant points of view. The result was certainly magnificent and aroused widespread comment.

A form of *Dierzella florida* known in gardens as *D. Sieboldii albo-marginata* is a fine example of variegation and has the additional merit of also being a flowering shrub of no mean value. The well-known variegated form of the Osier Dogwood, *Cornus alba*, var. *Spæthii* is extremely effective when space can be found to mass it in a large group.

The colored forms of the Conifers are for some reason or other seldom satisfactory. There is one, however, that usually excites interest and is burdened with the name *Juniperus chinensis procumbens albo-variegata*. This, as its name implies, is a prostrate growing form and the variegation consists of scattered branch tips of a delicate ivory yellow.

That elusive element known as "taste" must always enter into the use of variegated shrubs in gardens. Under some conditions, as for instance, in naturalistic plantations, they must be rigidly barred, but in some circumstances their judicious use is a decided advantage. Those forms where the color is indeterminate should be avoided. This applies especially to the yellows, for, unless the coloring is clear and distinct the only impression that one receives is that of an unhealthy plant.

* * *

The *Polygonaceæ* is a plant family that we usually look upon as having but little value horticulturally. True, it furnishes us with buckwheat for griddle cakes, and rhubarb as a corrective in case too many of them are ingested, but to supply material suitable for garden ornament the Knotweeds are usually considered of not much account. The fine appearance of *Polygonum orientale* when in bloom during September and part of October acted as a reminder that here was one species, at least, worthy of the gardener's attention. Further reflection brought to mind many others that are deserving of cultivation and finally the conclusion was reached that the family did not consist entirely of unprepossessing weeds and a few plants of economic and medicinal importance. *P. orientale* has long been known as a garden plant in this country—long enough to have become semi-natural-

ized in some places. It is a native of India and Loudon says "The seeds were first sent to Europe by Tournefort who saw it growing in the garden of the monks of the three churches near Mount Ararat. They cultivate this plant there not only for the beauty of its flowers, but for its medicinal qualities. * * *"

It is a strong growing annual which in good soil may attain a height of from six to eight feet. It has bold, pale green, heart-shaped leaves and in September produces quantities of dark pink blossoms arranged in the slender cylindrical spikes characteristic of many of this genus. It can be used to good effect at the back of the herbaceous border or naturalized in a semi-wild part of the grounds. The graceful panicles of bloom could probably be used in arrangements of cut-flowers—if they last in water, and they have the appearance of being capable of it. The approved common name is "Prince's Feather" but it is also known by the pleasing but cumbersome title of "Kiss me over the garden gate." This is almost as bad as some of the examples of scientific terminology of which complaint is made and is on a par with another gem of plant nomenclature—namely, "Welcome-home-husband-be-you-ever-so-drunk." The latter name is the vernacular for some unfortunate plant or other and, it is believed, is used in Maine. The writer is curious to know its scientific appellation!

Many gardeners, amateur and professional, have cursed the day when they introduced one or other of the strong growing perennial *Polygonums* to the garden. Many, attracted no doubt by the bold, and handsome foliage and vigorous growth, ten to twelve feet high, of *P. sachalinense* have planted it, but have wished they hadn't when they found in a year or so that it flourished far beyond their expectations with growths shooting up, anywhere and everywhere, yards beyond the point of original planting. Not all of the strong growers have so bad a reputation however, and *P. Sieboldii*, or *cuspidatum*, as it is sometimes called, can be used to good effect, but it, too, should only be planted in such a situation where it is possible to curb its tendency to ramble. This species attains a height of about five feet and is beautiful when covered with its abundantly produced white flowers.

There are a few *Polygonums* hailing from the Himalayan region, where they grow at altitudes ranging from 9,000-14,000 feet, that are used with telling effect in rock gardens in England. They are comparatively dwarf, more or less prostrate in fact, with good foliage and striking flowers. Coming from this altitude they ought to be hardy as far north as Philadelphia, at any rate, but so far as I have been able to discover they are not cultivated in this country. Amongst the most desirable ones in this group are *P. affine*, *P. Brunonis*, and *P. vacciniifolium*.

The climbing *P. Baldshuanicum* (one could wish it had a more euphonious specific name) is well known and widely planted. Few climbers surpass it when seen at its best covered with panicles of white or pink flowers. It remains attractive over a long period as the calyces retain their pink coloring long after the petals have formed. The seeds are attractive to birds and sparrows and are much in evidence when they are ripe.

There is one climbing member of this family, that is said to be much used in the south, which should be grown to a much greater extent in the greenhouses of the north. This is *Antigonum leptopus* which rejoices in the rather misleading name of "Mountain Rose." When its pendent racemes of pink blossoms are seen for the first time one is tempted to say it is a climbing *Begonia* so much do the flowers resemble, only superficially it is true, those of certain types of *Begonia*.

Hydrangeas

ARBORUM AMATOR

HYDRANGEAS are natives of Japan and China, Java, the Himalayas, and the United States. There are about thirty species, but about ten only of these with their several varieties are in use as ornamental flowering shrubs. Of these ten the species *paniculata* and its variety *grandiflora*, both hardy, are the only Hydrangeas commonly used in lawn, garden, and landscape planting, and these on account of their many meritorious qualities are planted in very large numbers.

Two General Divisions.—Hydrangeas may be divided into two sections, the hardy and the half-hardy. The hardy species and varieties may be used through a wide range of latitude in permanent plantings, but the half-hardy or tender species and their varieties can be used in permanent outdoor planting only where the winter temperature is comparatively mild.

The Hardy Foreign Species.—About forty years ago *Hydrangea paniculata* was brought into the United States from Japan, and later its larger flowered variety, *grandiflora*. These are the hardiest of all the Hydrangeas. They usually attain a height of six to eight feet, but are easily kept lower by pruning, which they bear well; sometimes they reach a height of twenty to thirty feet in rich soil and favorable locations. The white flowers, mostly sterile, of *paniculata* appear in ten to twelve inch long, erect, plume-like panicles, in early August, and turning from the creamy color, which they have at their opening, gradually to a greenish white well overspread with a red shade, continue to be objects of beauty well into the Autumn. The variety *grandiflora* has the same habit of growth and bloom, and period of flowering as *paniculata*, but its drooping panicles of flowers are much longer, often twelve to eighteen inches. There are three other varieties of *paniculata* no one of these superior to *grandiflora*, but interesting in a collection; these are *tardiva*, later flowering, but in other respects like the species; *præcox*, nearly like the species and *floribunda*, bearing more numerous and larger panicles than the species.

There is a species from Northern China named *Bretschneideri*. This is not new, but is not often seen, and is deserving of a larger use. This species is very floriferous, extremely hardy, and the earliest of all to bloom, its cymes of flowers opening in early June. This is regarded by many the most beautiful of all the hardy Hydrangeas.

Ustula pubescens is a pretty Himalayan species of dwarfish growth attaining a height of only five feet but having a breadth greater than its height. This also is an early flowering species, producing in June many cymes of sterile flowers, at first white, but later changing to rose-color and continuing to be in attractive condition well into the Autumn. It is perfectly hardy in New England and New York.

The Hardy Native Species.—*Hydrangea arborescens* is a native shrub found from New Jersey to Iowa and southward to Florida. It is of erect growth. The period of its blooming is June and July when it bears cymes of mostly perfect flowers. Far more showy is *sterilis*, a variety of *arborescens* whose flowers are mostly sterile, and which is commonly called Mountain of Snow. This variety or sport of *arborescens* was found growing wild in the mountains of Pennsylvania. The extreme hardiness of this variety, which is said to be able to withstand a temperature of thirty degrees below zero, makes it suitable for planting in the colder parts of our country.

The leaves of most Hydrangeas have the same shape, but the species *quercifolia* is so called because it has oak-shaped foliage. This native species is found growing wild from Kentucky to Alabama. It reaches a height of about six feet, and has a spreading form. In June on the ends of its tomentose branches there appear pinkish-white flowers which later assume a purple shade of color. The rich colors of the oak-shaped foliage of this species in the Autumn are very effective and add to its value. It is hardy as far north as Philadelphia, and even farther in protected locations, and its value as an ornamental flowering shrub is still further enhanced because it grows vigorously in seaside gardens.

Radiata, a third native species is found growing wild from North Carolina to Missouri and south to Georgia, but is hardy as far north as Philadelphia. This species, quite similar to *arborescens*, bears cymes of flowers, all sterile, in June and July.

More recently two new varieties of our native species have been introduced, both hardy. One of these two is *cinerea sterilis*, a variety of *radiata*, and the other *grandiflora alba*, a variety of *arborescens*; the first is known as Teas' Snowball Hydrangea. Both of these newer and very desirable native varieties produce in July, before *paniculata*, and its variety *grandiflora* begin to bloom, large heads of white flowers.

Some Uses of Hardy Hydrangeas.—Large groups of Hardy Hydrangeas on lawns with large areas, and smaller groups on those of lesser size, of a form which harmonizes with the contour of the lawn, and properly located are very effective not so much as foliage shrubs as because of their magnificence of bloom during Mid-Summer and early Autumn. Equally useful are they in corner groups on each side of the entrance of drives and walks leading into the home ground, or in the foreground of larger shrubs and trees. Small groups of the bush form or single specimens of the tree form placed at proper intervals are excellent for outlining walks through lawns. The species *paniculata* may be used to form a deciduous hedge, and answers the purpose very well, if kept severely pruned. Well grown single specimens of either the bush or tree form are effective on lawns of quite limited area in front yards.

Soil, Location and Culture.—Hydrangeas thrive best in a moderately moist, well drained, rich, porous soil. The soil around these should be worked shallow, and a generous application of pure ground bone worked into it two or three times yearly. Free waterings just before, and throughout the blooming season are very beneficial. Hydrangeas make a larger growth in a partly shaded location, but bloom more freely in the unbroken sunlight, if watered abundantly.

Pruning and Propagation.—Pruning should be done after the shrubs become dormant during the Winter. The strong canes should be cut back to one to three pairs of buds, and the weak shoots removed entirely. The smaller the number of buds, the larger the blooms. For propagation these stronger canes may be cut into pieces about six inches long, tied into bundles and placed upright in boxes of pure sand, deep enough so that only one pair of eyes come above the sand. The sand should then be wet thoroughly from top to bottom, and the boxes placed in a cool cellar or pit till Spring, when they should be set out about six inches apart in rows in the garden to the same depth which they were in the sand. They will make good sized bushes in two seasons. Another way

of propagating is to take cuttings of half-ripened wood in the Summer and put them in the propagating bench in the greenhouse, and, as soon as rooted, plant them out in the open ground.

Half Hardy or Tender Varieties.—These belong to the genus *opuloides* which is a native of Japan and China, and which has been cultivated there for many centuries. This genus for convenience has been divided into the *Japonica*, *Hortensia*, and *Stellata* groups. All the varieties of these groups produce cymes made up of white, pink or bluish flowers, in some varieties a few, and in others all being sterile. The varieties of the *Hortensia* group, whose globose cymes of nearly all sterile flowers are very showy, are most cultivated. Chief of these are *Hortensia* which is said to have been introduced into England by Joseph Banks in 1790, *Cyanoclada*, whose branches and peduncles are dark purple and *otaksa*, all bearing pink or bluish flowers, and Thomas Hogg with pure white flowers. In comparatively recent years many beautiful forms mostly of hybrid origin of the *Hortensia* group have been introduced. These hybrids are largely used for forcing into bloom under glass.

These varieties cannot be used in permanent out-door plantings in a latitude where they will be subjected to a low temperature for, though the plants may not be killed, the buds which produce next year's blooms will usually be destroyed where they are subjected to more than fifteen to twenty degrees of frost. Bending down the branches,

and mounding up with earth so as to cover the whole plant, or planting them in very protected positions may enable them to endure the Winter without loss of flowering buds.

Soil, Culture and Propagation.—A mixture of sandy loam, swamp muck, dried cow manure and pure ground bone makes a good compost in which to grow half-hardy Hydrangeas. They need an abundant supply of water during the Summer and applications of liquid manure are very beneficial. A partly shaded location is most favorable. Cuttings with one to three pair of eyes taken from the plants in February or March root readily in the greenhouse propagating bench.

"The great task of pioneering and bringing the land under the plow has, for the most part, been accomplished. The people of this nation are no longer content with the attainment of the three primary necessities—food, clothing and shelter. They demand in addition that the food shall be the product of many climes; that the clothing shall befit their station and work; and that the shelter shall not only provide bodily comforts but that it shall be surrounded by trees and shrubs, not alone for the shade and protection they offer, but for the pleasure they afford as they express life's great drama in the passing of the seasons."—(*Sec. of Agriculture Meredith in The American Rose Annual.*)

Distinctive Gardens

BERTHA BERBERT-HAMMOND

IN gardens there is no valid excuse for monotony, for nowhere else is there greater opportunity for the fullest expression of one's individuality.

There are numerous varieties of gardens both in the formal and natural styles of gardening. There are Italian, Shakespearian and tropical gardens; sunken, hanging and rock gardens; rose, tulip and iris gardens; water, wild and window gardens; besides many other sorts of gardens. The choice, indeed, is so wide that it is limited only by the length of the purse. The whim of the individual can be readily gratified, eliminating effectually the tiresome uniformity sometimes encountered. Surely in gardens there need be no wearisome sameness if the garden maker is a nature lover and will give free rein to his imagination. A garden reflects in subtle ways the character of the gardener. On the other hand, the garden greatly influences for good, the character of the one who works in it. The refining influence of constant association with growing things is markedly discernable in the individual. Being close to Nature improves him physically, mentally and morally, and imparts a pleasing poise. Not even an Atheist could work daily in a garden without a keen appreciation of the miracles in growth of seed and plant, and a realization of the existence of a supreme power. As expressed by Gene Stratton Porter, "Nature can be trusted to work her miracle in the heart of any man whose daily task keeps him alone among her sights, sounds and silences."

In recent years, formal gardens, carpet bedding, geometrical designs and other stiff, conventional styles of gardening (excepting possibly in public parks and on large estates) have been less popular, the trend being toward the so-called "natural" style of planting. With many well-informed gardeners, the change in style of gardening has been quite radical. Where the expanse of lawn was once cut up into various geometrically

shaped beds, filled with plants of uniform size, we now see a restful plot of velvety sward, with flower borders and shrubbery along its edges and the outlines of the buildings, forming a sort of framework or setting to the landscape picture. Many of these informal borders, especially with amateurs, have acquired much additional interest according to the personality of the garden maker. One literary friend has an "author's corner," where bloom plants obtained from the old-time gardens of a group of well-known New England writers; another dotes on a "poets' row," a third takes great pride in her "historic" garden, a fourth lives in a "memory garden," containing plants such as were grown in the gardens of her childhood. Then there are "friendship gardens," and many others of a similar character. The several ideas incorporated in these gardens of sentiment may be worked out in other directions in endless ways, varying according to the associations or inclinations of the owner, and assuring interesting, unique gardens. A garden with the intimate, personal touch becomes glorified and exerts an influence and charm that is indescribable. It becomes "a school of peace," a blessed refuge from the cares and worries that beset—

"My garden paths that turn and wind
And lead me far from daily grind
Of tasks not wholly to my mind.

Are paths of peace.

When cares upon me weigh and press
I flee from worry, care and stress,
And gain a season's sweet redress

Along these paths.

They lead me out to life and light,
Far from fear's most deadening blight;
They lead me up the spirits' height:

My garden paths.

—Edith Porter Kimball.

Protecting Tender Garden Subjects

HENRY J. MOORE

WITH the advent of early Winter, naturally the grower of semi-hardy herbaceous and other plants becomes much concerned as to the method to be employed in protecting these from the Winter's cold. Sometimes over anxiety for their safety leads him to apply the mulch or protective material too thickly, with the result that many of the subjects are smothered. Sometimes he is too careless and applies too little, and consequently the subjects freeze.

In order to successfully protect the tender plants, there are certain simple but essential things to learn. When we make a study of the way in which Nature protects the dormant subjects during Winter, we find that the straws, leaves and twigs are usually blown in and around the plants and lodge very lightly. Even the leaves and stems of herbaceous subjects fall lightly over the roots which produced them. These protective materials, when covered with snow, usually afford adequate protection during the coldest months.

What does Nature teach us by the forementioned simple illustration? That the Winter's mulch she applies is composed of coarse but light materials through which air may pass. Thus, when we apply a mulch to our herbaceous borders, or to beds, or plots of tender subjects, we must see that a proper material is chosen and properly applied, so as not to preclude the entrance or exit of air.

Perhaps the greatest mistake is made by applying well rotted stable manure to serve as a protective mulch. While this may suffice in the case of many subjects, generally the practice is wrong. When saturated with moisture the manure settles down into a dense soggy mass through which air cannot readily pass, if at all, as the spaces between the fibres are filled with water to the exclusion of air. Well rotted stable manure may be advantageously applied to a host of hardy well rooted subjects as a manure, and in fact this is generally practiced during the Fall, but we must realize that there is a vast difference between a manure and a protective mulch.

Strawy litter shaken out from the manure pile, or this mixed with leaves, or even leaves which have been piled away for one year are themselves good for use to protect the tender plants of our borders. These should be spread over the border to a depth of about four inches, or over the roots of individual subjects as the case may be. Between the fibres of this coarse material there are air spaces which will always be filled with air. This film or cushion of air acts as a buffer to the cold outer air, preventing its too rapid entrance and to the relatively warmer air, preventing its too rapid exit from beneath the mulch. Thus a slow and gradual but nevertheless sure interchange of air takes place. The outer air is warmed in entering, the inner air does not leave too rapidly, and consequently the plants are not chilled by sudden changes of temperature.

A soil in which there is a circulation of air is usually warmer, and certainly is drier than one in which little circulation takes place. A heavy dressing of rotted manure precludes the entrance of air, and when once wet will keep the soil in a wet condition as long as the manure itself holds the moisture. When such a soil

freezes it becomes almost a solid mass of ice. A soil covered with a coarse protective mulch is usually drier, as the mulch above it does not hold water, but air. Such a soil when in a frozen condition is usually more or less "honeycombed," most of the spaces being only partially filled with ice, thus favoring aeration.

No matter what materials are used for our purpose, the protective mulch should not be applied before the ground is lightly and, if possible, permanently encrusted by frost. By this time much of the moisture may have escaped, and when the Winter's covering is applied the tender subjects will enjoy a warmer and drier habitation through the cold months. To apply the mulch earlier than this may result in injury. If after applying it a warm or rainy spell should occur, the extra protection will tend to make the plants less hardy and less able to withstand the Winter, and in some cases to actually start prematurely into growth,—we must not cover up our plants too early.

The principle outlined above will also apply to tender plants whose stems and leaves remain green through Winter, and which depend upon these for the flowers of the coming season. Let us take Canterbury Bells as an example. When protecting these, it is only a case of applying the material in a slightly different manner, as it is not the roots which will freeze, but the tops, therefore these must be protected. It will, however, be obvious that a heavy layer of mulch will have a tendency to break the stems and leaves. Once broken they quickly decay and often the plants will damp completely off. The more impervious to air the mulch, the greater the danger of damping.

If a few small branches of trees cut to a length of about eighteen inches are stuck in the ground, about the same distance apart, throughout the area containing the plants, and the protective material is placed lightly over these, they will prevent it from pressing down upon the subjects unduly. Sufficient air will pass through the covering for the needs of the plants (for plants require air in Winter as well as Summer). The covering will remain much drier when partially suspended on the branches, than were it on the ground, and the danger of damping be largely obviated.

Tender shrubs, such as Roses of many kinds, may be protected by simply scattering strawy litter lightly around the roots, or by tying straw around the stems. The grower, however, should not attempt a too elaborate operation when protecting these, or in fact any tender subjects. Any method of protection which tends to exclude pure air is wrong, any which favors a gradual interchange of air is right. Certain parts of plants must "breathe." Even the soil must breathe—the gases of fermentation must escape. It must be aerated or it cannot be healthy, and as an aerated soil is warmer than an unaerated one plants are more likely to winter successfully under the former condition.

The writer will leave the reader to answer the question he now asks. The more the reader ponders over it, the greater will be the benefit derived from this article. Why is the hand in a woolen glove through which the air can pass, warmer on a zero day than one encased in a kid glove, which is practically impervious to air?

Profit in Bee-Keeping

H. W. SANDERS

"HONEY in the Comb," is rightly considered as one of Nature's delicacies and until the invention of the honey extractor was the usual form in which honey was marketed. Sometimes it was "strained" by crushing or mashing the combs and then straining the honey out through a cloth, and even today customers often ask for strained honey. Whether in the comb, or extracted, however, honey can usually be marketed without much difficulty because of its universal popularity, but the manner in which it is put up and placed on the market often makes a large difference in the price received.

There are not many large producers of comb honey at the present time, and most of the honey sold in this form is the product of the small apiary. The man with just a few hives may not want to invest in the extractor and the outfit necessary for uncapping and extracting the combs, while it often happens that he is a gardener or farmer with a certain amount of spare time in the Winter that can be devoted to fixing up the supers and sections ready for the next Summer's crop. Herein is the first point to be considered from the marketing end of the game, for unless the sections are well made and carefully put together the bees will build their combs unequally and bulged and untidy sections will result. So the aim should always be to have the selling business in mind from the start. Then when the actual honey season is on, the supers should be removed from the hives as soon as ever they are finished so that they will have no chance to become stained or soiled. There is nothing more beautiful than the white sections of honey when they have just been finished by the bees and yet when they are left on the hive too long they get spotted so that it is impossible to get a good price for them. Even partially filled sections will be readily bought if the honey looks thoroughly clean and appetizing.

Once off the hive the sections should be carefully scraped with a sharp knife so that the wood looks white and new, and then each section placed in a cardboard carton to keep it clean and to protect the fragile honey from getting damaged. A leaking section of honey is a nuisance to all concerned. If the honey is to be shipped away to a dealer the special shipping cases supplied by the manufacturers are the best for they have glass on each side that shows the honey and this is quite a help to prevent damage in transit. The sections should be placed "end on" to the direction of travel in a railroad car, but "side on" when a wagon is used for the jolts come from the side in the latter case.

Some beekeepers have been working up a very profitable trade in comb honey by cutting it into "individual portions," draining them of surplus honey and then selling them to restaurants and hotels in tiny cartons. We have known cases where as much as sixty cents a pound was realized for honey in this form. If by chance any comb honey has become granulated then there is nothing else to do but to melt it up and treat as extracted honey. In melting, the honey is cut from the wood, placed in a crock which is then stood in hot water and the contents melted as slowly as possible. When cold the wax will be in a cake on the top and can be lifted off, then the honey can be bottled.

Where the honey is produced in the extracted form it will have to be handled and sold in a different way

from comb honey. In the first place it is highly necessary that the honey should be thoroughly ripened before the extractor is used. When the nectar is gathered by the bees from the flowers it is as thin as water, and the bees ripen it by driving currents of air through the hive by fanning with their wings. Until they have evaporated it down to the right consistency the honey contains a large proportion of water, and if it is extracted and bottled in this condition it may ferment and sour. We have known of honey bursting the containers through the effects of fermentation. If the bees are allowed to finish the job, however, honey will keep indefinitely, and the longer it is kept the better it will get, provided only that the place where it is stored is quite dry. Here, by the way, a word of warning may not be amiss to avoid placing honey in the icebox. It will absorb moisture and spoil, whilst if kept in the kitchen cupboard or some other warm place it will keep for years if need be.

Having the honey well ripened before extracting, the next thing is to run it into a tank from the extractor and permit all the fragments of wax, etc., that accumulate in the process, to float to the top. If the honey can be bottled from a faucet at the bottom of the tank, then there will be less mess and much quicker work. After a little practice the bottling process can be carried on quickly and without the spilling of a drop of honey.

The containers should be clean and of an attractive character. Glass should always be used for local trade, although cans are best where the honey has to travel by rail. For the small producer, the ordinary fruit "sealers" in pints and quarts form a package that is useful to a housewife after the honey has been used up, and she will usually pay for sealer and honey both, without hesitation. The fancy bottles of flint glass used by the large bottlers are more attractive than the homely sealer, but the customer has to pay for them and then throw them away when the honey is done, and in these days of high cost of living customers are taking a very keen interest in finding out where their money goes to.

The label should be carefully drafted and printed, and should contain the beekeeper's name in prominent type, then a guarantee as to the purity of the honey, and finally concise directions for liquifying the honey if it gets too hard. There are still many people who do not know that granulation is a sign of purity in honey, and that only the honey "that the real bees made," will granulate. To these folks the label will bring a better understanding, and if they really prefer liquid honey they can follow the directions.

It pays to encourage customers to use granulated honey, for if they once get the taste they will not want any other kind, and the chances are that the beekeeper is the only one who sells it; for the large bottlers of honey have to heat their honey before the average grocer will buy it, and this heating prevents it granulating for months.

If extracted honey has to be shipped far it is best to use five-gallon cans, which hold about sixty pounds of honey and are crated two in a case. Most of the large quantities of honey that go annually to the bottlers, to bakers and candy makers, and to the manufacturers of patent medicines is packed in this way.

A local trade grows year by year if it is supplied with good honey properly packed, and many beekeepers make quite a substantial addition to their incomes in this way.

How Often Does a Branch Bear Leaves?

WILLARD N. CLUTE

HOW often does a branch bear leaves? At first glance this seems to be an extremely foolish question. One is inclined to say that a branch bears leaves every year as long as it lives, but a little investigation serves to show that this is far from the truth. As a matter of fact, branches bear leaves but once—during the year the branches themselves were formed. We have only to consider the way in which leaves and branches are formed to see that this is so. Everybody is familiar with the buds that stud the bare branches at the beginning of the year and everybody knows that these buds consist of numerous tiny leaflike parts, attached to an equally minute stem. When the bud scales loosen in Spring these minute parts soon develop into a leafy branch, but after these leaves have fallen no new ones ever take their places.

Every one can call to mind, however, branches that appear to be clad with new verdure as often as the vernal season comes round, and if branches do not bear successive crops of leaves it may be asked where these leaves come from. The answer is that shortly after the season's leaves are fully spread, often as early as July, new buds begin to form in the angle between the leaf and stem, or, in the axil of the leaf, as the botanist puts it, and it is this bud that produces the next crop of leaves. When the old leaves fall off they leave a more or less distinct scar. This is especially noticeable on the horse chestnut, the hickory and the Chinese tree of heaven, but may be easily found on any of the woody plants that drop their leaves in Autumn. It will be noticed in examining these leaf scars that the leaf has been removed by a clean, smooth cut and that the wound has been carefully closed with corklike tissue to prevent loss of sap. The separation of the leaf from the stem, therefore, is not an incidental matter, but has been carefully provided for a long time in advance. By the end of August and often earlier a layer of brittle cells, called a cleavage plane, is constructed across the base of the leaf. Then when an accumulation of frost on the leaf increases its weight, or when a high wind brings pressure to bear upon it, the brittle cells give way and the leaf goes whirling to the ground.

Though a branch bears leaves but once, this does not necessarily mean that it is clothed with leaves for only a season or part of a season. In certain evergreen plants, such as the laurel, pine, spruce and fir, the leaves may remain on the plant for a long time—in extreme cases as long as fifteen years. One may discover evidences of this in almost any evergreen thicket. The place where the growth of the branch is stopped by the cold each year is easily discovered and it is evident that any leaves on one side of this zone must be more than a year old.

In regions of uniform warmth and moisture the woody vegetation often grows nearly continuously, since it is never exposed to cold or drought and has no need to stop and protect the growing points. In more northern regions, however, the plants seem to have learned by long experience that a season of cold follows the growing season and weeks before it occurs have begun to prepare for it. Often all the leaves that are to appear in a given year are present in the winter buds when these have been expanded the plant stops, though it may be in the middle of Summer. The species in our flora that have been derived from southern ancestors commonly fail to prepare for the more rigorous season and continue growing until frost nips their tender tips.

Several of the species that prepare for Winter early may take on a new growing impulse late in Summer and thus have a sort of new Spring all to themselves. This habit is very noticeable in the elms, where the tender yellow-green of the new foliage is very conspicuous against the darker green of the older leaves. In every case, however, the new leaves spring from new stems or extensions of the old ones—never from that part of the stem previously developed.

In some instances leaves seem to spring from the same points year after year, as in the dwarf branches of fruit and other trees. It is possibly not widely known that many of our trees bear two kinds of branches—long branches and dwarf branches. Pine trees are rather extreme in such matters, for they have not only the two kinds of branches but two different styles of leaves to go with them. One may find dwarf branches in the apple and pear trees as short stubs along the main branches. These are usually called fruit spurs by the orchardist. Such dwarf branches may produce new flowers, fruits and leaves year after year, but a careful examination will disclose the fact that they do not produce new leaves and flowers from exactly the same place. The spur grows a trifle longer each year and affords new places for the leaves. The exterior of such a spur is usually a mass of overlapping leaf scars.

Although it is the fashion for the majority of leaves to live but a single season, and permitted of only a few to exist for much more than a dozen years, there is one most conspicuous exception in the *Welwitschia* of western Africa where leaves live as long as the plant does—often fifty years or more. There is good reason for this, however, for the plant has but two leaves. These are long and broad in spite of the plant's relation to the pine family and sprawl about on the soil. The peculiar form and method of growth has induced the British Government, in whose territory it grows, to protect it from extermination, and thus the plants are likely to live on for centuries, the best illustration to be found of the great age to which the leaves of plants may attain.

WILL YOU HELP SUPPRESS THE SIGN BOARD VANDALISM ALONG OUR HIGHWAYS?

At the convention of the National Association of Gardeners, held in St. Louis in September, a resolution was adopted condemning the despoliation of the beauties of the natural scenery along our highways by unsightly sign boards. It was decided to begin a country-wide propaganda to arouse an indignant public sentiment against this nuisance.

We invite every individual and organization interested in seeing the scenic beauties along our highways protected and conserved to co-operate with us in suppressing this sign board vandalism.

If interested, address

SIGN BOARD COMMITTEE

National Association of Gardeners
286 Fifth Ave., New York, N. Y.

The Month's Work in Garden and Greenhouse

HENRY GIBSON

GET ready for the coming Winter by gathering protective material for the tender plants, and for covering up the hardy beds and borders, generally after they are frozen over. Clean up the remnants of the season's crops, so as to have everything in readiness for a clean start another year.

In the Vegetable Garden Celery will need to be stored sometime during the month. It may however remain outdoors for awhile if it is well hilled up and leaves spread over the plants to protect them from frost. Dig all root crops without delay, and store in trenches; or an old box or barrel buried in the ground may be utilized. Better still store in moist sand in a frostproof cellar.

Late crops of lettuce and endive still outdoors may be prolonged by covering them with salt hay and leaves, or they may have a frame of sash put over them. Keep the endive dark which will help blanch it.

Cabbage may be put into trenches upside down and buried.

Protect French globe artichokes by laying some fine brush over them before covering them with cornstalks and other coarse litter.

There is still time to sow a cover crop of rye in many sections. Heavy retentive soils will be benefited by trenching or double digging at this time, leaving the surface as rough as possible.

In the Flower Garden Complete the planting of all spring flowering bulbs as soon as possible. Dig over vacant beds and leave the surface rough. Start giving protection to such subjects as tender Hydrangeas, Boxwoods, Rhododendrons and Hemlocks in exposed situations. Cut off and burn all flower stalks; gather up all stakes, tie into neat bundles and put them away for another season. Get the mulching material to some convenient spot and apply it when the ground freezes an inch or two. Perennials may be planted until the ground freezes. They require good care in the way of adequate protection when planted later.

Lift and store, preferably in a dry cool cellar, Montbretias, Cannas, Dahlias, Gladiolus, and other tender summer flowering bulbs. Cannas winter well under a greenhouse bench. The best method of wintering dahlias, is to cover them with moist sand on the floor of a frostproof cellar.

Cut everlasting flowers, such as Gomphrenas and straw-flowers before they are badly frozen and hang up indoors to dry.

Fall sown sweet-peas bloom much earlier than Spring sown. Prepare the ground well and sow at once. In the colder sections protection during Winter is necessary.

About the Grounds Do not allow the grass on the lawns to remain too long over the Winter. The exceptionally warm weather we have been experiencing, has caused the grass to keep on growing later than usual and if not kept cut will present a tangled mass of dead material in Spring that will prove difficult to cut.

The planting of deciduous trees and shrubs may be proceeded with as long as the ground remains open. Protection is an important factor in successful wintering

of late planted stock, for which ample provision should be made at once, so that the material will be on hand when wanted.

The Orchard

The orchard is an important and permanent feature of every place whether large or small, and the preparation of the ground should be thorough. Plow deep and subsoil to break up the hard pan usually found beneath the surface soil. Make the holes where the trees are to go much larger than necessary and fill up with good soil, well incorporated with plenty of barn yard manure.

Apples and pears are best set in the Fall, while stone fruits are better left until Spring.

Grape vines and fruit trees may be pruned anytime now. If the wood is wanted for cuttings or scions of fruit tree for grafting, tie into bundles, and bury them in the ground until Spring.

In the Greenhouse

The *Chrysanthemum* is now at the height of its season, and, as Queen of the Autumn, is occupying the premier place at all the flower shows in the land which are so numerous during the month. These flower shows have rare educational value, especially to amateurs and beginners in the art of flower growing. Whenever possible an effort should be made to attend these shows and to exhibit also.

Anything from an humble head of salad to the most expensive greenhouse plant, that has exceptional merit should be exhibited; it not only creates interest and adds to the exhibition, but helps to win moral and financial support for the show.

In the greenhouse the plants should have a dry, buoyant atmosphere, the ventilation and fire heat being regulated to this end. Cuttings of the large bush varieties should be rooted now.

All pinching out of the flowering scapes of the winter flowering Geraniums should cease now.

If not already done lift from the open ground, Campanulas, Dielytras, *Corcopsis*, *Iris*, early flowering shrubs, etc., and pot them up for forcing. After watering place them in a deep frame until needed. Allamandas and Bougainvilleas, which have been growing during the Summer, have made all their growth and should be rested.

Roman Hyacinths and Paper White Narcissus, that have made a mass of roots can be placed in a temperature of 50 degrees F., and successive batches brought in every ten days or so to maintain a succession.

Cinerarias and Schizanthus should be potted on as they require it. Grow them cool, not over 45 degrees at night.

Fluctuations of temperature should be avoided with Poinsettias, keeping them steadily round 60 degrees F., at night. Feed them with liquid manure twice a week when the bracts show color.

Early cutting of Carnations may be taken now. All pinching of the flowering plants should cease. See that a proper relation between night and day temperature is maintained, and that watering is done with care.

Roses that have been cropping for some time past will stand some feeding. Liquid manure is good, but dangerous in careless hands. Mulching with half soil and half cow manure is perhaps the safest way to supply food to these plants at this time of the year. When watering

see to it that sufficient is given to wet through the original soil, but on the other hand, do not make the soil become a sodden mass by giving too much water.

Palms and stove plants need a moderate resting period. Reduce the water supply somewhat and let the night temperature fall to about 60 degrees F. at night.

Large flowering English primroses offer something in the way of variety. Plant them out in a violet house temperature, or winter them in pots in frames bringing them in sometime during February for Easter flowering.

Vegetables in the Greenhouse

Vegetables are being grown more and more as winter greenhouse crops.

In the cool house, lettuce, radishes, spinach, green onions, parsley and beets are all possible, and if space is available, cauliflower should be added to the list.

In the same house under the benches, asparagus, rhubarb and french endive may be forced.

In the warm house, that is, where a temperature of 60-65 degrees F. at night is available, beans, forcing melons, cucumbers and tomatoes do well. They add variety to the list of fresh winter vegetables.

Mustard and Cress may be sown at intervals during the Winter as required for the table. Mint and Tarragon are useful for seasoning and should be lifted from the open ground before it freezes up. Plant them in boxes and place in a cool house where they will soon start into growth.

In the fruit house the vines may be pruned as soon as they have shed their leaves, and a sharp lookout should be kept for mealy bug. Remove the loose bark, and fumigate the house with hydrocyanide acid gas. Paint the cane with wood alcohol and be careful to keep this liquid away from the eyes.

SULPHUR AS A PLANT FOOD

That sulphur is an important plant food, often a limiting factor in maximum production, is a recent discovery in scientific research in the field of agriculture which appears to have an important bearing upon agricultural production in the Far West, inasmuch as it has already proven its economic value in Oregon in districts similar in many fundamental respects to many thousands of acres of cultivated area in the eleven Western States.

For many years it was known that sulphur in minute quantities was utilized as plant food. The quantity apparently was so small, however, that no provision was made for supplying it in commercial fertilizers. It has within recent years been determined that previous methods of analysis were incomplete and modern methods brought to light the fact that leguminous crops, especially alfalfa and clover and members of the cabbage family, were heavy feeders on sulphur and that its application as a fertilizer to soils in the arid and semi-arid districts proved highly beneficial to yields.

Scientists on the staff of the Oregon State Experiment Station began experimental work in 1912 and already it has been learned that there are in that state approximately 100,000 acres growing alfalfa which will return an increased yield of one ton per acre on an average, a thirty per cent increase, from the addition of one hundred pounds of flowers of sulphur. This single application is sufficient for three years in all districts and apparently for four years in certain districts.

No ill effects are noted in Oregon from the use of sulphur, which might be expected to bring about an acid condition in the soil. Freedom from acid conditions is brought about by the prevalence of lime in

arid and semi-arid soils, there being ten times as much lime in such soils as is the case under humid conditions.

It is also believed that sulphur will also have an important effect on Eastern agriculture. Many state experiment stations in the East are now working on the problem. In past years gypsum, a combination of lime and sulphur, 15 per cent sulphur, was highly beneficial to soils growing clover. This was attributed to the stimulating effect of the lime. After a few years of continuous application, the beneficial effects were lost. This was believed to be due to acidity of the soil and such was doubtless the case to some extent. Professor F. C. Reimer, of the Oregon Experiment Station, who carried on the experiments there which are proving of so much practical value, advances another probable occurrence, the idea that since gypsum added only the sulphur and a small amount of lime and at the same time stimulated production to a great degree other limiting plant foods became exhausted to the point where production necessarily diminished. He believes that if at this stage the other elements had been supplied, the profitable returns from gypsum would have been continued. This is a basis upon which investigations in Eastern states are being conducted.—F. L. BALLARD, Oregon State College.

TAMING THE WILD FRUITS

All of our cultivated fruits have been developed through years or centuries of cultivation from wild species. Grapes and apples date from earliest history, but the grapes and apples as we know them are much more palatable than the fruits of Bible times. Peaches came into prominence among the Greeks and Romans soon after the beginning of the Christian Era, and through generations of selection have been vastly improved. Oranges, coming as they did from warmer climates, were known to the Romans in the days of Caesar and Cicero, but they did not possess the excellence of the Washington Navel or Valencia now grown.

Much progress has been made in the improvement of some kinds of fruits, but in the case of our native berries, such as the blackberry, raspberry or dewberry, few cultivated varieties are superior to wild forms. In very recent years attention has been given to the cultivation of the native blueberry, with results that are highly pleasing, and from present indications the blueberry is certain to soon be recognized as an important fruit and possess a size several times that of the best wild specimens.

From the tropics now comes the avocado, a fruit that is gaining popularity by leaps and bounds. Unlike the banana, pomegranate, fig or orange, the avocado is neither sweet nor sour in taste. Instead, it is oily, like the olive, and from its size, shape and color it has been dubbed the "alligator pear." The avocado is responding in a very gratifying manner to the influences of civilization, as is evidenced by the general superiority of the recent named varieties over the wild forms from Guatemala and the West Indies.

Much room for improvement still exists in all of our cultivated fruits. Plant breeders are striving to improve peaches, apples, pears, cranberries, oranges, grapefruits and others that have been under cultivation for many, many years, while the fruits of more recent introduction, such as the everbearing strawberry, blueberry and avocado are receiving the attention of skilled plant breeders as well as of the amateur.

Many wild fruits yet remain to feel the influence of civilization, and it is not to be doubted but that another generation will find as commonplace many fruits that are entirely unknown today.—*American Fruit Grower*.

A Lesson on Plant Physiology and the Plant in Relation to Its Environment

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

ONE of the objects of these lessons has been to set forth the whys and the wherefores of gardening practice to a greater extent than is usually found in ordinary and popular gardening books. In endeavoring to cover as much ground for this purpose as possible each month, it has not been practicable to do more than merely scratch the surface of the various subjects dealt with. In spite of this shallowness of treatment and of other shortcomings, it is gratifying to learn from both amateur and professional gardeners that the lessons have been found interesting. We have therefore decided to delve somewhat deeper into first principles to deal more fully with the various phases of plant life and of the soil upon which that life grows, and we trust that the resulting lessons will prove worthy of continued appreciation.

The deeper and wider a gardener's knowledge of the underlying principles of his work; of the whys and the wherefores of his practice, the more interesting it is to him and the more intelligently he carries it out. Without at least some knowledge in this direction, he cannot claim to be a gardener at all. An important fact to be borne in mind is, that these principles have the same bearing all over the world, and this applies with equal force to all the fundamental operations of gardening, such as soil preparation, fertilizing, seed sowing, planting, etc.

To those having only a slight acquaintance with plant life it will be obvious that the ground covered by the above caption cannot be gone over, however shallowly, in one lesson, and, although we are not proposing to deal with it at all exhaustively, it is therefore proposed to take more than one issue in discussing matters included under it.

All life upon the earth is covered by the science of biology, and is divided into two classes or kingdoms: the animal or zoological, and the vegetable or botanical; judged by the number of living subjects, the vegetable kingdom is very much the greater. There are some forms of life, principally microscopical, which are claimed by both zoologists and botanists as belonging to their respective branches of science.

Most people are willing to pay more or less lip service to botany as an interesting subject, but the true relation which this branch of science bears to the daily life of man is appreciated by comparatively few, and there is a popular impression that botany is of small practical importance, offering as its best reward only the discovery and naming of new plants; to which may be added, sometimes much to our annoyance, the renaming of old ones. Even many, who know that botany represents the foundation upon which gardening, farming and forestry rest, imagine that its chief aim is the classification of plants.

There is little in the appearance of linen, sugar, or rubber, for instance, to remind one of their vegetable origin; but when we remember that food, fuel, clothing, lumber, furniture, paper, medicines, and hosts of other essential materials are derived from plants, we get a hint of the universality of the vegetable kingdom, and of the vast importance of the science of botany, especially on its economic side.

The raw material required for the things above mentioned is built up by chemical action and stored in one part or another of a plant. Plants are therefore so many laboratories engaged in the manufacture of all kinds of chemical compounds which man has been, and is, slowly, learning to convert to his best use. Through successive centuries these discoveries have been made, first by accident, then by experience, and finally by scientific investigation. The ambition of botanists is to penetrate into the inner recesses of these laboratories of Nature; to discover there her secret processes, and to employ her forces to carry out their own designs. The vegetable kingdom abounds in problems which need more continual and complete investigation, and questions are continually arising which scientists hesitate to answer. While we are nowhere at all approaching finality in these connections, still much is known about plant physiology.

Literally, physiology means the science of Nature, and, although the term is now never used, phytiology is the science of plants. Strictly speaking in present day usage, plant physiology deals with the anatomy of plants and with the functions of their various organs. One of the main features in the art of gardening is to provide such an environment for a plant as will enable all its parts to function in the highest possible degree.

The initial starting point of a *flowering* plant's (botanically

called *phnognomous*) separate existence is at the time the ovule in the ovary, which is to be found at the lower extremity of the pistil of the flower, matures into a fruit. This becomes fertilized by the pollen produced by the stamens, resulting in the formation of a seed containing an embryo. The ovule stands in exactly the same relationship to the plant as the egg, or ovum, does to the animal, therefore we may say that the starting point of all the higher animals and plants is the egg.

Among *flowerless* plants (known as *cryptogamous*), that is, plants without either stamens or pistils, such as ferns, mosses, horsetails and fungi, reproduction is by means of spores (simple cells) in place of seeds. These spores are commonly, in the case of ferns especially, contained in one-celled spore-cases (sporangia) and these hold but one kind of minute, one-celled, powdery, numerous spores, which are discharged when the sporangia finally split open.

The lowest forms of plant life consist of a single little sack, or cell. In these, reproduction is entirely by cell-division, that is, a cell divides itself into two or more cells which ultimately separate into single plants. This cell division goes on indefinitely and, when the environment is favorable, with extreme rapidity. Most of these unicellular plants are microscopic and the micro-organisms living in the soil, to which attention has been called in previous lessons, belong to this class of plants.

All forms of animal and vegetable life consist of one or more cells. The higher plants and animals are built up of many cells united, which cells assume various forms and properties in the different organs, and, to some extent, in different species. Sometimes the united cells can be readily separated from each other, and the cell is then seen to be an independent structure surrounded by its own cell-wall. These cells can only be seen through a microscope, although they vary greatly in size, and when living contain a transparent, jelly-like substance, called protoplasm, which protoplasm is the source of, and the medium for the manifestation of, the various phenomena of life. Under certain conditions this protoplasm may become dormant, in which state it may exist in a dried form for a considerable period, as is the case with seeds, and may again become active under suitable conditions of moisture, temperature, etc.

Growth or increase in size takes place partly by expansion of cells already formed and partly by cell multiplication. The latter may take place by division, as in the case of the unicellular plants, or by the formation of new cells within the older ones, the young cells thus brought into existence attaining full growth by subsequent enlargement.

It appears probable that the earliest plant life upon the earth was in the form of unicellular plants, and in the geological period known as the carboniferous none but *flowerless* plants existed. Their environment was then practically that of a gigantic hot-bed, with the atmosphere in a state of continual mist, thus producing ideal conditions for these plants to grow with extreme rapidity and to attain a gigantic size. Their remains are seen to-day in the deposits of coal which are found close to the North Pole, as well as in other parts of the world. The *flowerless* plants we have today are the degraded descendants of these earlier forms. The sun's rays could never fully penetrate the continuous pall of mist, and it was not until this environment passed away that *flowering* plants appeared, these representing a higher and more intricate form of life.

As before mentioned, *flowering* plants are those bearing true flowers; that is, having stamens and pistils, either both or one or the other, and which produce seeds containing an embryo.

We may roughly divide *flowering* plants into three classes: (1) Those having perfect flowers; that is, flowers which all contain both stamens and pistils; (2) plants which produce flowers of two kinds on the same plant (*monoecious*), one of which contains the pistils and the other the stamens, and (3) those species having staminate and pistillate flowers upon different plants (*dicocious*). When the staminate and pistillate flowers are produced separately, it is only the latter which can bear fruit. In a few plants, such as the asparagus and the strawberry, some individuals produce perfect and others imperfect flowers.

Examples of the second class can be seen in corn, squash and melon. Sometimes, in the two latter and in their allies, numerous staminate flowers are produced, but very few pistillate. It is an

article of faith among many professional gardeners that old melon seed—of course, provided it is not too old to germinate—produces more pistillate flowers and therefore more fruit than is produced by plants grown from new seed, and with the idea of artificially aging seed they sometimes carry it about in their pockets for some time previously to sowing. So far as I know, this theory has not been subjected to any scientific test, although such test would be simple to carry out provided the age of the seed experimented with was definitely known.

Among dioecious plants, those more commonly seen in gardens are the various species of *Ilex* (Holly); also, as a pot plant in the North, the *Acuba japonica*, sometimes called the *Acuba Laurel*, but it belongs to the Dogwood family. These plants are more ornamental in their berried state, for which purpose pistillate plants are the first necessity, and these must also have some staminate plants growing near them for the production of pollen. In growing the *Acuba* under glass it is necessary to shake a flowering staminate plant over the flowers of the others. If the former produces flowers much before the latter, then the pollen may be collected and kept in a dry state until the pistillate flowers are ready. The pollen will not, however, keep longer than a few weeks.

In the animal kingdom, spontaneous movement, either voluntary or involuntary, is an attribute of life, generally looked upon as a matter of course. In the animal, the brain is conceded to be the motor which puts into motion the power or force which is at the back of all movement. While plants have no brains, yet much evidence of brain power is to be found in connection with them by reason of the fact—amongst others—that they exhibit the faculty of being able to move voluntarily in various ways and directions.

This power of voluntary movement can be observed in connection with the germination of pollen grains.

When pollen grains come into contact with the outward end (stigma) of a pistil, which in a ripe state exudes a sticky, sugary substance, germination takes place in the form of the growing out from them of a tube, which tube grows down the pistil into the ovary and by this means the setting of good seed is brought about.

If pollen grains are placed upon a suitable medium on the slide of a microscope the tubes will be seen to grow out in all directions, but if a piece of ripe stigma is placed among them upon the slide the tubes will soon deviate from their indifferent paths and will grow towards the stigma. Similar phenomena—in principle—is sometimes to be seen in connection with the germination of seed when the root, if it emerges towards the surface of the ground, will turn round and grow downwards; also, in the way in which roots, of trees and shrubs especially, will grow towards and invade rich soil, and towards water. This power of growing towards congenial media is very widespread among plants and is known as chemotaxis, the idea being that the pollen tubes and roots are attracted by the chemical nature of the medium to which they respectively grow. Without disputing the possible correctness of this idea, it does not appear to be improbable that some other force, namely, brain power, may be behind this power of movement, especially when taken in connection with other evidence which cannot be gone into now.

The transfer of the pollen from the stamens to the pistil is termed pollination and is to the gardener of the greatest importance in connection with fruit production. Botanically, the term fruit is applied to all ovaries, or seed cases, whatever form they may assume; popularly, the word fruit is used only in connection with those ovaries which become enlarged, fleshy and edible, like the apple.

In the case of some perfect flowers, the stamens and pistils are so arranged that the pollen falls directly upon the pistils, but in numerous instances the arrangement is such that self-pollination is impossible and the introduction of pollen from outside is necessary, which is known as cross-pollination. This cross-pollination is brought about mainly in two ways: by wind and by insects. Certain plants, such as the grasses and conifers, are always wind-pollinated. The flowers of these are generally inconspicuous, without nectar or fragrance, and they produce a great abundance of light, dry pollen, which is sometimes carried many miles by a strong wind. The pistils of these plants are comparatively long in the case of corn—in which case what we call the silk is the pistil—very much so; also, in many instances they are very feathery and are thus adapted to catch the flying pollen.

On the other hand, flowers of insect-pollinated plants are more or less showy, and have either nectar or fragrance, or both, which attracts the insects and, in going from one flower to another, they carry pollen with them and cross-pollination is accomplished.

Cross-pollination is known to be beneficial even in the case of those plants bearing self-fertile flowers; that is, flowers in which the ovule can be fertilized by the pollen produced in its own flower. The benefits noticed by the cross-pollination of self-fertile flowers are larger and more numerous seeds, producing more vigorous plants, and in the case of fruits, they are invariably larger. Nature favors cross-pollination in perfect-flowered plants

by numerous adaptations which prevent self-pollination; as by so locating the stamens that the pollen is not readily deposited on the stigma of the same flower, or by maturing the pollen either before or after the receptive stage of the stigma. In some cases pollen is infertile upon the stigma of the same flower or plant which is quite fertile on stigmas of other plants of the same species.

This condition of self-sterility is not usually due to a deficiency in either the quantity or the quality of the pollen, or to defective pistils. The pollen grains often germinate upon the stigma, but fertilization does not take place. Why this is so is not clearly understood. It cannot be degeneration of the pollen, because two self-sterile varieties are invariably fruitful when planted together.

Self-sterility is very important in connection with the production of certain fruits. It is common in varieties of apples, pears, plums and grapes, but is uncommon or unknown in cherries, peaches, currants, gooseberries, strawberries, raspberries or other like berries. Regarding strawberries, some of the most productive varieties yield little or no pollen and are even without stamens; they are, therefore, unproductive unless growing near varieties producing plenty of pollen.

Self-sterility does not appear to be a constant factor in any variety, as those which are self-sterile in one locality are frequently self-fertile in another not very far away. In reviewing the evidence in this connection from various authorities, Fletcher says: "It is quite evident that the degree of adaptation of a variety to its environment has much to do with its ability to fruit abundantly from its own pollen." It is not, therefore, possible to make a complete list of fruit varieties under the headings of self-fertile and self-sterile respectively which would be applicable to all localities. There are, however, a few varieties which are generally quite dependable as being self-fertile. Among apples these are, Ben Davis, Baldwin, Rhode Island Greening, Oldenburg, Yellow Transparent and Yellow Newtown.

While there does not seem to be so much positive self-sterility among pears, many are uncertain, and the only kinds usually considered reliably self-fertile are Angouleme (Duchess), Bosc, Flemish and Seckel.

Practically all varieties of Japanese and native plums are self-sterile, but while most European varieties are self-sterile in England, these varieties when grown here are generally self-fertile.

Many varieties of grapes are self-sterile, the most strongly self-fertile ones being Concord, Delaware, Diamond, Niagara, Winchel and Worden.

Quinces and peaches are always self-fertile.

With the possible exception under some conditions of the apple, all pollination of fruits is done by insects and almost entirely by bees. Hooper estimates that eighty per cent of cross-pollination of fruits is done by the hive bee, fifteen per cent by various wild bees, especially the Bumble Bee, and five per cent by miscellaneous insects. The importance of bee-keeping in connection with fruit production cannot be overestimated, and it is worth while to keep bees for this purpose alone, irrespective of the surplus honey they may give. To avoid destruction of bees, spraying for the larvae of the codlin moth should only be done just before the flowers open and soon after the petals have dropped, never when the trees are in full flower.

While cross-pollination appears in most cases to cause a self-fertile variety to produce larger fruit than when it is fertilized by its own pollen, there does not appear to be any other influence exerted by it so far as the fruit itself is concerned. For cross-pollination to take place between two varieties it is, of course, necessary that the bloom at about the same time.

The flowers of some plants can only be pollinated through the agency of a special insect. This is the case, for example, with Red Clover (*Trifolium pratense*), which never produces seed in countries or districts where the Bumble Bee is absent. In New Zealand, for instance, this bee had to be imported and naturalized before Red Clover seed could be produced.

In Nature an absolutely seedless species is unknown; seedless varieties are not, however, uncommon, although there are not many plants upon which edible fruit develops without the fertilization of the ovule resulting in the formation of a seed with a living embryo.

Seedless varieties of fruit have generally in the first instance resulted from a sport, and when seedless fruits of any kind have a greater economic value, such as is the case with bananas, citrus fruits and the grape from which the seedless raisins are obtained, the sport has to be increased by suckers, grafts, or buds.

Seed production exhausts the plant more than any other of its life processes, as the plant must store up in the seed prepared and highly concentrated rich material for the food supply of the embryo.

Many plants die immediately after they have produced seed, and nearly all annuals and biennials do so after flowering, whether they have been allowed to produce seed or not; perennials are always more or less weakened by seed production.

The flowering season of most plants can be greatly prolonged

(Continued on page 379)

Departments of Foreign Exchange and Book Reviews

RIGHT OF PROPRIETORSHIP AND PROTECTION IN HORTICULTURAL NOVELTIES

The question is eagerly discussed—and this may be conceived—by our able seedsmen, hybridizers and, in general, by the horticulturalists who, with reason, maintain that their efforts in the way of improving and of perfecting the floral and vegetable species and varieties should be recognized and be productive of the legitimate profit that their labors and their researches ought to assure them.

And certainly it is not a feeling of pure vanity nor of egotism that has been able to dominate those who have claimed, with arguments of indisputable right, the protection of the fruit of their patient studies.

Any one whatever has the right to have officially patented a valuable invention; why should not the horticulturist and the floriculturalist benefit at all from the same right?

The account, very complete and well ordered, of the last Horticultural Congress, an account given by our sympathetic confrere, Mons. Ch. Arranger, informs us that Messrs. Pernet-Ducher, Rivoire and Turbat, considering the actual status of French legislation, which likens, it is said, the registering of horticultural novelties to the registering of manufacturers' brands, have expressed the opinion, the very just opinion, that "that which is of most importance is to affirm, in ways most prompt, the right of priority in horticultural novelties."

All sensible souls will range themselves along with this opinion. But it seems fitting that the interests of horticulture demand more than the right of *priority* and that it is the right of *proprietaryship* that ought to be considered.

As Mons. Emile Lemoine has said, at this same congress, horticultural proprietaryship has actually nothing effective, and we add, to the great loss of all skillful hybridizers and of investigators whose perseverance, for all that, should deserve to hallow for them the results that are fortunate for everybody, in a way the most positive.

Mons. Emile Lemoine would advocate a system analogous to literary proprietaryship and to that that obtains in the arts, which is regulated by international conventions. It is the sentiment of Mons. Pernet-Ducher also, who demands the protection of the state through the deliverance of a patent right.

It is therein perhaps that is to be found the most rational and most efficacious system of protection.

Already, in the session of June, 1919, the Council General of the Maritime Alps was inspired with this same thought in expressing "a wish tending toward the right of proprietaryship of a floriculturist who, by his labors, has succeeded in creating a new variety of flower."

It is a pleasure for us to recall this desire which accords in the best possible way with the conception that ought to be formed in all reason of the right acquired by the initiator, or by the inventor, in a matter horticultural as in a matter industrial.

Just as in the case of every proprietaryship, industrial or artistic, the creation of a new variety horticultural, floral, vegetable, etc., ought to procure for him who is its author the sanctioning of an absolute right over the results of his labors.

Now look at the unreasonableness of it in this way:

When a painter, in order to compose a picture with more or less resemblance, can draw inspiration from a flower, in reproducing, more or less faithfully, the purity of the lines and the richness of the colors, and sees his work protected against reproductions, against those who would be tempted to copy, when his right to proprietaryship in a work of art is recognized, the explorer or introducer, the sower or the floriculturist who, by his art (which the public at large is ignorant of or misinterprets too often)—by his scientific researches and by his labors, let us say which often are long, painful and costly, has succeeded in fixing a new variety, in realizing, to follow the expression that is sanctioned, a new gain that is going to enrich the French horticultural inheritance, this cannot insure the legitimate ownership of the fruits of his patient researches by preserving, at least for a certain time, the exclusiveness of this ownership to which his quite personal creation ought to give an incontestable right, if not inprescriptible.

In the actual status of legislation have the horticulturist and the floriculturist the possibility of protecting themselves against an immediate appropriation, through copying, of the novelties that they have created?

It seems not so, for they cannot claim the application of the

law of July 19-24, 1873, on artist proprietaryship, which applies exclusively to the rights of ownership of literary authors of all sorts, of musical composers, of painters and designers. They have not any more the ability to appeal to the law of July, 1844, concerning letters patent for inventions, the patent right not being furnished except "for a process having for its object an *industrial result*."

The sole and only resource, then, that they have in the actual condition of legislation, is the right of priority, by virtue of which the registration of horticultural novelties is likened to the registration of manufacturers' trademarks, which is far from being equivalent to the right of ownership.

To pretend that the transformation obtained in a certain type of flower, by artificial hybridization or by any other treatment having for its end the calling forth in the plant of a vital difference of natural evolutions, cannot be likened to the proprietaryship of an author, of a composer, of a painter or of a designer, is at least going too far. For it is incontestable that every original conception, realizable under a new form and reproducible, constitutes a work that may be protected, that is to say, patented, because it is the fruit of personal work and the creation traceable to a horticulturist, just as legitimately as that of the industrial worker or of the artist, and may claim the protection of the law.

This protection is accorded to works of art of a low class and to industrial innovations having only a relative value. It is inexplicable that it should be refused still to the one who, in order to obtain a horticultural novelty, has devoted special knowledge, at times has even created for this end a particular method and has had to consecrate to the work long and patient researches lasting some years.

One ought then to expect that the ownership of novelties in horticultural matters should be likened to literary and artistic proprietaryship and that it should enjoy the same protection.

Horticulturists will join, without reserve, in the wish formulated by the Council General of the Maritime Alps, a wish over which one could not congratulate one's self too much, the more because it is a matter sufficiently rare to merit its being emphasized.

This cause must triumph over indifference and apathy. It must assure the legal protection of novelties to the persevering researches, to the persistent efforts and to the science of our horticulturalists.—*Le Jardin*.

LENGTH OF DAY AND BLOSSOM TIME

The remarkable effects in forcing premature blooming produced by the curtailment of the period of exposure to daylight have already been described. It now remains to recount the no less remarkable results observed by Messrs. Garner and Allard when plants thus forced are re-exposed for the full period of daylight. They found that plants of Soy Beans treated in this manner ripened their seed; their leaves turned yellow and the plants looked as if they were about to die a "natural" death; but instead they threw out new branches and while still bearing their first crop of ripened seed blossomed for the second time in September—the month in which the plants that throughout their life had been exposed to normal daylight blossomed for the first time. Similar resumption of growth took place among Asters and other plants transferred from curtailed daylight to normal conditions, and a second blossoming coincident in time with the first natural blossoming of normal plants also took place. The gardener with the habit of reflection will think in this connection of the second flowering in the Autumn of such plants as Anchusas and Cat Mint when cut down after they have finished their first period of blossoming. The experiments carried out with early and late varieties of Soy Beans and with other plants show on the one hand that certain plants are what may be called "short day" plants, that is, they only flower when the light hours of the day do not exceed a certain maximum, which of course varies for each plant, and on the other hand that some plants fail to find in a given latitude a day of length sufficient to enable them to develop blossom at all. Thus a Composite, *Mikania scandens*, maintained throughout the year under short day conditions remained sterile and could only be prevailed upon to blossom in the summer time when long days occur. Conversely, late varieties, e.g., of Soy Bean, are apparently late because they can only blossom when the long summer days have given place to the shorter daylight periods which characterise the later months of the year. It would seem that these observations throw a new and interesting light on the sterility and other vagaries of plants introduced from one

country to another. The failure of Sweet Peas to flower in the West Indies may be due to an incompatibility between the length of day there and that to which this plant is naturally attuned, and the change or maintenance of season of flowering of introduced plants may be due to a like cause. That the failure of some tropical or sub-tropical plants to blossom in countries of temperate climate would appear, from the authors' observations on the behavior of *Phaseolus vulgaris*, to be attributable to a like cause. For this plant, when grown in the open in the latitude of Washington generally fails to blossom before it is cut down by autumn frosts; whereas if taken up and sheltered in a greenhouse it produces flowers freely during the short winter days. When the days were experimentally limited each to seven hours *P. vulgaris* was found to bloom in 28 days, and to ripen its seed pods a month later; albeit that when grown in the open it could not blossom before October 11, 109 days after germination; it is as though the plant has to wait until the days are short enough in order to find release from the vegetative stage and to pass into the reproductive phase. According to the views developed in this interesting contribution to our understanding of seed time and harvest, plants range themselves in three categories: short day plants, which in such a climate as ours must flower either in Autumn or in Spring, long day plants which are summer flowerers, and ever-flowering or perpetuals, for which the limits of suitable days' lengths are so wide as to free them apparently from the restraint which controls the blossom time of the plants of the first two categories. Although the cautious will no doubt prefer to await the result of further experiments, yet it cannot be doubted but that Messrs. Garner and Allard have opened up an extremely interesting line of inquiry, have shed a new light on many obscure phenomena exhibited by the blossoming plants and have elucidated the mode whereby plants conform to the divine behest—"so long as the earth endureth, seed time and harvest shall not fail."—*The Gardeners' Chronicle* (British).

THE CLEMATIS FOR NATURAL EFFECT

No genus of plants furnishes us with such a varied assortment of handsome flowering subjects of climbing habit as do the Clematises. These, though always beautiful when in blossom, are never seen to such advantage as when permitted to ramble at will through and over other living growth. It should be remembered that, for artistic effect, the more freely climbing plants grew the better, and that most species of *Clematis* may be allowed unrestrained freedom with the happiest results. The large-flowered Clematises provide a charming picture when clambering among the branches of shrubs and trees. It is often thought that these large-flowered Clematises of the *lanuginosa*, *patens*, *florida*, and *Jackmani* sections are of too delicate constitution to admit of their being planted in close proximity to trees and shrubs possessing a vigorous habit of growth, but such is far from being the case, even such a rapacious neighbor as a Laurel hedge failing to affect their vitality and being garlanded in the summer months with trails of widespread stars.

The *Clematis*, in common with all climbers, should, at the start, be afforded a deep and rich root-run, but when the plant has once become established it is enabled to hold its own against the most greedy associates. Large-flowered Clematises have, unfortunately, a habit of dying off suddenly when apparently in the best of health, shoots that are one day green and vigorous being found withered on the succeeding day. This failing, which has been styled the "Clematis disease," has been ascribed to a variety of causes, such as the widely-employed system of grafting, exposure of the stems to the sun, excess of water at the root, and the after-effect of injury by frost during the Winter, but, up to the present, no authoritative decision on the subject has been arrived at. That the evil of grafting, while, doubtless, tending to weaken the plant, is not the sole reason of dying off is proved by the fact that specimens raised from layers and seed sometimes fail in the same manner, but the three other assigned causes—namely, excess of moisture, scorching of the stem, and injury by frost—are avoided by growing the plants with other subjects whose roots absorb any overplus of water, and whose growths shield from damage by sun or frost. Thus it is that in large-flowered Clematises grown over shrubs or in company with other climbers the "disease" is rarely seen.

The pruning required by the different kinds of *Clematis* will to a great extent depend upon the position in which they are growing, for if festooning any extensive support, such as neighboring trees, or clothing an arbor, little if any pruning will be required, while, on the other hand, if trained to a wall where space is limited, pruning is absolutely necessary in order to keep the specimen within bounds. *Clematis montana* flowers from the young shoots directly they push from the old wood, and conse-

quently any severe pruning in Winter will limit the display of blossoms. All that is needed is to remove any weak or exhausted wood that is not likely to flower, but be sure and retain the vigorous shoots, as they will yield the greatest wealth of blossoms. *Clematis Jackmani*, on the other hand, forms shoots of considerable length before they flower, so that they may during the Winter or early Spring be pruned back to good strong buds and any weak or exhausted shoots cut out. *Clematis Duchess of Edinburgh* will require little pruning, all that is needed being the thinning out of any weak growth during the Winter when dormant. *Clematis indivisa lobata*, the evergreen species that requires the protection of a greenhouse, blooms early in the Spring, and all the pruning needed must be done directly the blooming season is past. Where it is necessary, the vigorous shoots may be shortened back to good strong eyes and the weak ones thinned out, but in the case of this *Clematis*, as with the others, the less pruning that is indulged in, unless in some exceptional cases, the greater will be the display of blossoms, though such a free grower as *C. Jackmani* may sometimes form too dense a tangle unless pruned back somewhat during the Winter before the buds push into growth.—*Gardening Illustrated*.

A LESSON ON PLANT PHYSIOLOGY

(Continued from page 377)

by the prevention of seeding, and even in the case of many annuals, especially with sweet peas, which soon perish if allowed to seed but which will continue to bloom throughout the Summer if the flowers are persistently picked. The same is true with the majority of perennials, and even with those perennial species, like *Iris*, *Peonies*, and bulbous subjects, flower stems should be cut as soon as the bloom falls. It may be taken as a general rule that the more flowers we cut the more we have.

The prevention of seed formation can, too, with advantage, be carried out among shrubs, especially with those forming their flower-buds the year before they bloom; examples of the latter are seen in the *Rhododendron* and *Syringa* (Lilac).

The same principle applies in connection with many vegetable crops. Whether the produce is required at the time or not, all peas, beans, cucumbers, etc., should be gathered as ready, for the total yield will be considerably increased and the bearing of the plants much prolonged by gathering before the ripening process begins.

Overbearing of fruit is frequently harmful, and certain varieties of some cultivated fruits, as apples, pears, plums and peaches, may in some seasons set such a full crop which will, if it is all allowed to mature, cause such an undue amount of their reserve food to be devoted to fruit production as to result in greatly enfeebling the trees; in fact, instances have been known where a young tree has been allowed to bear such a heavy crop of fruit that death has resulted. It is always a wise procedure to thin a heavy setting of fruit before it has made much growth, as this will save the tree from undue exhaustion, and improve the size and quality of that allowed to remain. Also, in the case of apples especially, thinning tends to increase the possibility of an average crop the following year, instead of, in the case of a tree exhausted by overbearing, none at all.

In connection with fodder crops, grass and other things intended for feeding purposes should not be cut in such ripe condition as is frequently the case; their feeding value is greatly reduced when seed is permitted to form or ripen before cutting, and also more plant food is thereby taken out of the soil for no good purpose.

THE TREE

I love thee when thy swelling buds appear,
And one by one their tender leaves unfold,
As if they knew that warmer suns were near,
Nor longer sought to hide from Winter's cold;
And when with darker growth thy leaves are seen
To veil from view the early robin's nest,
I love to lie beneath thy waving screen.

And when the Autumn winds have stripped thee bare,
And round thee lies the smooth, untrodden snow,
When naught is thine that made thee once so fair,
I love to watch thy shadowy form below,
And through thy leafless arms to look above
On stars that brighter beam when most we need their love

—JONES VERY

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

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NEW MEMBERS

The following new members have been added to our membership list: Frederick Heeremans, Lenox, Mass.; George Jacques, Peter Carsselo, Cleveland, Ohio; Wm. Reid, Harrisburg, Pa.; Charles H. Young, Katonah, N. Y.; John Patton, Shields, Pa.; Samuel Langford, Newport, R. I.; George Graves, Tuxedo, N. Y.; Charles Green, Somerville, N. J.; William Webb, New York City; Timothy Kenny, Oyster Bay, L. I.; Robert S. Grantham, Manhasset, L. I.; Jos. Marshall, Tenafly, N. J.; Ernest L. Lory, Red Bank, N. J.; R. S. Egbert, So. Bellingham, Wash.; Z. W. Boyle, Milton, Mass.; Peter Peterson, Yonkers, N. Y.; William Thomson, Pleasantville, N. Y.; Warner S. Hamilton, Rosemont, Pa.; John Hildebrandt, Salina, Kansas; James L. Allison, Glen Cove, L. I.; David Watson, Oyster Bay, L. I.; Henry Goodband, Colorado Springs, Colo.; Thomas Twigg, Glen Cove, L. I.; Max Schiller, St. Louis, Mo.; August Koch, Chicago, Ill.; John Meisenbacher, Tulsa, Okla.; W. M. Gillies, St. Louis, Mo.; B. Gamester, Huntington, L. I.; John Fairweather, Bernardsville, N. J.; Arthur Stephen, Fort Erie, Canada; Peter Stobie, Cold Spring on Hudson, N. Y.; James Marr, Brooklyn, N. Y.; David Purgavie, Bayport, L. I.; Edward J. Lofving, Augusta, Ga.; William C. Cotterell, Topsfield, Mass.; John Dervan, Port Chester, N. Y.; Harry W. Johnson, Peckskill, N. Y.; Robert Wright, Port Chester, N. Y.; Albert S. Allen, Springfield Centre, N. Y.; Sydney Bowcock, Fairmont, West Va.; John Connolly, Oyster Bay, L. I.

AMONG THE GARDENERS

Charles Swain secured the position of gardener to William Crawford, Bridgehampton, L. I.

Louis Kay accepted the position of gardener on the L. B. Price estate, Greenwich, Conn.

Edward Harding resigned his position as gardener to William du Pont, Montpelier, Va., and accepted a similar position on the estate of F. W. Borchers, Elkton, Md.

Alexander Douglas secured the position of gardener on the Leroy Frost estate, Nyack, N. Y., succeeding William Allen.

William Allen accepted the position of gardener on the Pratt estates, Glen Cove, L. I.

Robert Budd secured the position of gardener to H. T. Bradner, Gates Mill, Ohio.

George Wood accepted the position of gardener on the L. C. Ledyard estate, Syosset, L. I.

Irving Schofield secured the position of gardener to D. S. Walton, East Orange, N. J.

John Dervan resigned his position as gardener to Morton H. Meinhard, Port Chester, N. Y., to accept the position of gardener to F. M. Sackett, Louisville, Ky.

Ewen MacKenzie secured the position of gardener to Morton H. Meinhard, Port Chester, N. Y.

ST. LOUIS ASSOCIATION OF GARDENERS

The first meeting following the National Convention was held at Forest Park, October 6.

The treasurer reported on the financial standing of the convention entertainment, that the combined entertainment, including the Missouri Botanical Garden, Saint Louis Park Department and Saint Louis Garden Club, was taken care of independent of the local association entertainment fund. Of the latter he was glad to announce a balance of seventy-five dollars. It was proposed by G. H. Pring that this money should be set aside as a convention fund to be used to send a representative to the annual convention. The member to represent the local society to be elected by ballot and the fund increased by assessment or by entertainment. The motion was unanimously adopted. Members remarked that it might be the means of other organizations adopting the same means of being represented at the future conventions instead of relying on one or two men to represent their organization at the expense of the individual.

The lecture of the evening was presented by President L. P. Jensen on The Relation of Birds to Gardening. An interesting discussion followed of the acts of certain birds in the Spring at the time of seed sowing. The question argued was whether to kill the birds that watched the gardener sow his seeds with the object of having a good meal during the gardener's absence. Mr. Jensen, however, was equal to combat the argument in protecting the birds.

G. H. PRING, Cor. Sec.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

286 Fifth Ave. M. C. EBEL, Secretary New York

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Last year I cut off a horse chestnut tree about twelve feet from the ground and placed a birdhouse on the top. This season, new shoots have been constantly appearing. What can I do to kill the stump and prevent new growths?—D. C. B.—N. J.

I would suggest that you remove the soil from around the stump of the tree to enable you to reach the roots. Then hack the roots to bruise them, and apply a strong solution of carbolic acid on the wounds. This will kill the roots and prevent any future growths.—D. E. K.

I have a bed of Antirrhinums that were set early in the Spring. I had then about fifty plants, now about thirty of these have died; they all seem to have the same affliction. The foliage wilts and the plant soon dies, and I am unable to find any insect either on the plants or at the roots, or in the stems, that is causing this. They seem to drop off in all sections of the bed, but some are still blooming and doing fine. I have lost a few of my Asters in the same way, but not nearly so many. I have also had trouble with my Delphiniums rotting at the ground. I lost all of my seedlings this Spring with that trouble. Is the soil infected with some Fungus that is causing this, and if so, is there any remedy for it? Thought possibly a heavy liming might do it good. This is the first season I have worked this garden, as it has been running wild for years; that is, the former owners planted in the Spring and let it grow up to weeds each Summer, which I don't imagine did the soil any good. I am used to gardening in New England and conditions here are so different it is going to take time to get used to them.—G. P. McK.—Ga.

Regarding the trouble you are experiencing in raising Antirrhinums and Delphiniums, these plants usually act the way you have described when they are attacked at the roots by a small maggot which is found in the soil. But as you say you can discover no insects on their roots, it may be due to the fact that the soil has been neglected, and while it may be rich in its nature, it may have soured, and in that case a good application of lime would be most beneficial. I would suggest that you do not use any green manure, especially with Delphiniums, if you later find that you have to fertilize the ground.—E. D.

Can you tell me how to permanently rid my garden of the white grub worm? The area is about one-eighth acre, and I have great difficulty in raising raspberries and strawberries. It is almost impossible to raise them on this account.—A. A. L.—Mich.

The most effective way of ridding your garden of the white grub worm, is by applying lime to the soil this Fall, and rake it in, or if it would be possible for you to do so, plow up the soil and then apply the lime. How permanent an effect such an application will have, will depend very much on the soil surrounding your own grounds, for if this is affected and not treated, the grub worm will soon invade your soil again from the surrounding grounds.—K. M.



Winding Up Your Window Boxes

When I was 10 years old, Dad gave me a Waterbury watch that you wound up each morning with a monkey wrench, and that made so much noise that everybody in the house was always up in plenty of time for our early breakfasts.

As noisy as it was winding up, it made a noiseless noise when it ran down. In which particular it was like window boxes when their Summer filling is done for, and they sit there yammering for their Winter clothes.

And speaking of their clothes, we have some Yellow and Green Retinospora and Arboretum that are just the thing for Fall and Winter effects. And, of course, Ivy—you want plenty of that. Happily for you, we have aplenty.

Start winding up your window boxes. We can ship promptly or in many cases deliver by truck.

R. Roehrs

 **Julius Roehrs Co**
At The Sign of The Tree
Box 20 Rutherford N.J.

Here and There

RHUBARB.

A rhubarb plantation, when once established, becomes a permanent institution. I have in mind beds that to my certain knowledge, have been cropped continuously for more than fifty years, and, apparently, are becoming more thrifty each year. These beds were made by excavating a cubic yard for each plant, filling the hole thus made with a mixture of equal parts of rotted manure and good garden soil, covering with the earth taken from the excavation, so as to form a

ridge and setting the plants upon the ridge.

And bear in mind that the one great secret of success in rhubarb growing lies in the heaviest kind of fertilization. Rhubarb is not very particular in regard to the character of soil, provided there is sufficient moisture in it, though, of course, it will not stand wet feet. One of the best ways to grow it is to mulch very heavily around the crown, as soon in the Fall as the tops have been killed. Use good manure for this purpose, but cover the crowns with straw. Then, as soon as the frost is out of the ground in the Spring, work the manure well into the soil. If this is done, the plant will need no more attention, except to harvest the stalks, until the next Fall, since the

DAHLIAS FREE

Three new Peony-Flowered Dahlias that sell at \$1.00 each.

Ninigret, rich dark red, clouded and striped lighter. **Powhatan**, dark crushed strawberry, a flower of very beautiful shading, free bloomer. **Frances Lane**, light lavender red; this flower is wonderfully shaded and is difficult to describe.

A strong root of each of these three grand Dahlias and a year's membership to the American Dahlia Society, annual dues, \$2.00, which includes the interesting quarterly bulletin, giving Dahlia culture and Dahlia news of the world. Also a season ticket to the Society's Great Dahlia Show, all for the regular annual dues for 1921, \$2.00, with 50 cents extra, total \$2.50, to cover cost of packing, postage, etc.

Order at once. Roots will be sent in time for planting in the spring. This offer may not appear again. Address

EDWARD C. VICK

Secretary, American Dahlia Society,
205 Elwood Ave., Newark, N. J.

big leaves will effectually choke out all weeds.

Most gardeners make the mistake of allowing the stalks to attain full size before pulling. Much is gained in weight by this practice, but more is lost in quality. The flavor is at its best, in all respects, when the stalks are not more than half grown. Many growers cut or break the stalks close to the crown. This, also, is a mistake, and will surely diminish the yield. They must be pulled entirely free from the crown, leaving not the trace of a stub. It requires a little practice to do this every time, but it is an essential part of Rhubarb culture.

The leaves are sometimes used for greens, and there are also many apparently well authenticated instances of people being poisoned by their use. I have eaten them without unpleasant results, but they are not a desirable potherb, and hence it is not worth while to take any risks along this line. The truth is that the variety originally introduced into England, from Siberia, was introduced solely as a pot-herb, and was cultivated for this purpose for many years. Subsequently a variety was introduced from India, the root of which was used for medicinal purposes, and the foliage of which was highly poisonous. A variety was also introduced from China, by the way of France, the stalks of which were used. And the parent stock, from which all of our cultivated varieties are derived is a hybrid between these three varieties. And whether the leaves are edible or poisonous depends on the parent from which they derive their characteristics.—*Market Growers' Journal*.

WINTER PROTECTION FOR ROSES

I treat my Roses according to the habit of the plant. Such varieties as *Madame Plantier*, which produce blossoms on short stalks thrown out all along the large branches, I lay flat on the ground and cover with four or five inches of dry soil. Care must be taken to prevent the accumulation and retention of water in the covering. As a means to this end I cover the soil over the bushes with tarred paper or something which will shed rain.

Hybrid perpetuals, when grown on their own roots, send up so many shoots from the bases of the plants each season that I do not attempt to save all the tops. Instead I cut away most of them, and bank up the portion left with litter. For this class of Roses I find this a more satisfactory method than laying the bush down, as it greatly lessens the work, and, if plenty of manure is used to produce vigorous development,

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one gets finer flowers from the new growth than from the old stalks.

In laying down Roses one should provide oneself with thick canvas or leather gloves. The work of bending the bushes to the ground should be done with much care, as there is a great danger of injuring them if they are not carefully handled. Take hold of each bush at its base with the left hand, and hold it in a firm grasp while, with the right hand, you bend it down. Unless this part of the work is done with extreme care there is danger of breaking each bush close to the ground; but if its base is held firmly, and no abrupt or sudden pressure is made upon it, it will yield gradually and safely to the strain. After the plants have been placed flat upon the ground strips of wood or something with sufficient weight should be laid across each bush to hold it in place until it can be covered.

It is a difficult matter to lay down Roses of the Crimson Rambler class, with their thick, stiff canes. I do not attempt it. I gather the branches into as compact a mass as possible, tie them to keep them in place, and then cover them with evergreen branches tied on to the plants, which are left in upright position. Be liberal in the

use of this covering. It will not keep out the cold, but it will shade the stalks, and thus the protection from the sun will be secured. Then bank deeply about the roots. —*Country Gentleman*.

PROPAGATING BY LAYERING

There are several kinds of fruits and shrubs that we can very easily propagate at home by layering or mounding. I have had good success with gooseberries and several kinds of shrubs by this method, and currants can be rooted in the same way, though they are not so hard to root from cuttings as are the gooseberries. It is the best means I know of for rooting hardy hydrangeas.

To prepare the gooseberries, or other plants that grow in clumps of slender canes, we clean out the clumps in the Fall after they are dormant, and then it is well to cut a V-shaped notch in one side of the strong canes we wish to root, not cutting more than half through. Just cutting the cane half through from one way, slanting upward is practiced and works well enough, especially if the cane is bent so as to open the slit a little. Some do not cut at all but bend the canes sharply and fasten in

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this shape, but I have had best success with the cutting notches.

After preparing the clump thus, the next thing is to bank carefully with a mellow soil that is well pulverized so it will be firm around the canes and keep the cuts moist. During the Winter the canes will callous where cut or bent, and roots will form here during the next growing season. By fall they will be strongly-rooted plants and can be divided and transplanted either in the Fall or the next Spring.

While it is possible to root a large number of the canes of a good clump, the plants will be better if only the stronger ones are used. Many of the weaker ones can be cut away before layering so the strength of the plant can go into the selected canes. Some of the canes can be left to grow naturally, and these will not be very likely to root, and will renew the old clump. Sometimes canes will root if not cut or bent, but the conditions must be ideal to secure this. It is much surer to prepare as suggested.

Grapes and rosebushes can be rooted in the same way, only we have to bend down the canes and stretch them along on the ground. I have seen several fine plants grown from one long grape cane, and also from a crimson rambler rose. In both cases I have cut the canes, but I have seen grapes rooted without cutting, rooting at each joint.—*American Fruit Grower*.

THE LACE FLOWER

In the heart of every flower lies a secret. The dainty lavender flower in my garden shows that the secret of Queen Anne's flower as some wizard saw the purple spot in her white lace and from it bred a flower more dainty than that of the wild carrot or *Daucus Carota*, yet retaining its manner of growth.

Last Winter this flower was largely catalogued as the blue lace flower. It is not

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blue, but a lavender suggesting *stokesia*. It is better so, for we like to think of old lavender and lace.

This is a new flower bred from one which came originally from Europe, but which is now growing wild among us, making pretty birds' nests as it seeds. Yet as we look at this exquisite new flower with the dainty sparkle to its bloom we think of ladies of an older day when Nathaniel P. Willis and Charles Sprague wrote. We will leave the rosebuds to the debutantes, the daisies to the children, but let the old ladies tuck these dainty blooms into their white kerchiefs holding them in place by their cameo brooches over their black satin gowns. Are there any such dear old ladies left? Remember there is a sparkle to these lavender blooms.—*Horticulture*

JAPANESE BARBERRY

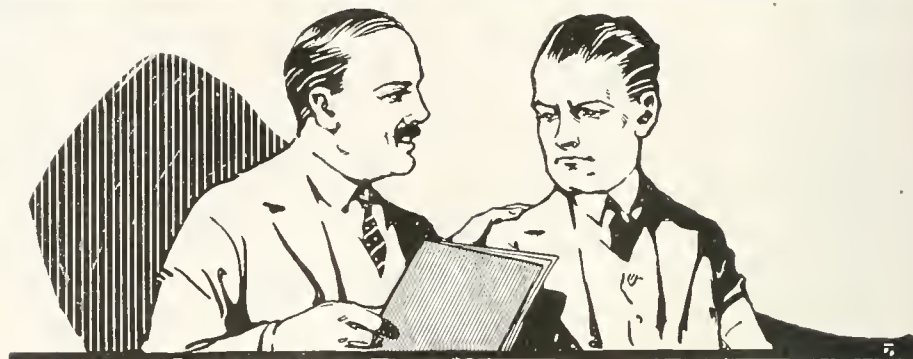
The Japanese barberry is one of the best and most popular of the low growing shrubs. It is extremely hardy, has beautiful foliage and makes an ideal low hedge. Can be trimmed to most any shape desired or it is very attractive when allowed to grow up untrimmed. The common barberry and the purple variety of common barberry are not planted to any great extent on account of their susceptibility to acting as a host plant for the wheat rust. On account of its similar name to the Japanese barberry, some people have confused this splendid plant with the common barberry, but there is absolutely no danger of wheat rust from the true Japanese barberry and it can be planted with entire safety. The government and different state authorities brought out this point when they were carrying on the wheat rust campaign and at that time told the public that there was no reason to stop planting the Japanese barberry as it was entirely harmless and is one of the best shrubs.

Other points of value in the Japanese barberry hedge are the brilliant coloring of the foliage in Autumn and the red berries that hang on throughout the Winter and until Spring. Early in the Spring when the small green leaves appear, the contrast of the red berries and the bright green of the leaves is exceedingly attractive. You can plant these in a single row hedge or in a double row with the plants zig-zag, so that each plant in one row is opposite the space in the adjoining row. The double row will give a thicker hedge in a quicker time and the small thorns of the plant make it an excellent protective hedge. You can trim barberry into a round ball or other shapes.

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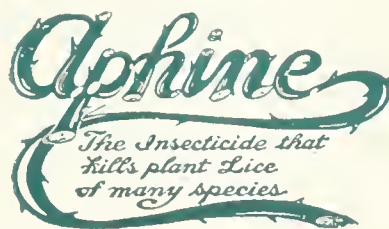
THINK YOUR WAY TO SUCCESS

The key to success today has not changed from what it was fifty or a hundred years ago. It still is right think-

ing which has its application in action—action that results in the correct decision.

The truism that brains are superior to brawn never needed more emphasis than it does today. The business man who thinks logically, makes unerring decisions, and then has the courage of his convictions to act boldly on those decisions is the man who will forge ahead and attain his goal. If he thinks along the wrong lines, if his reasoning power is weak and his judgment warped, his decisions will be incorrect and the result will be failure.

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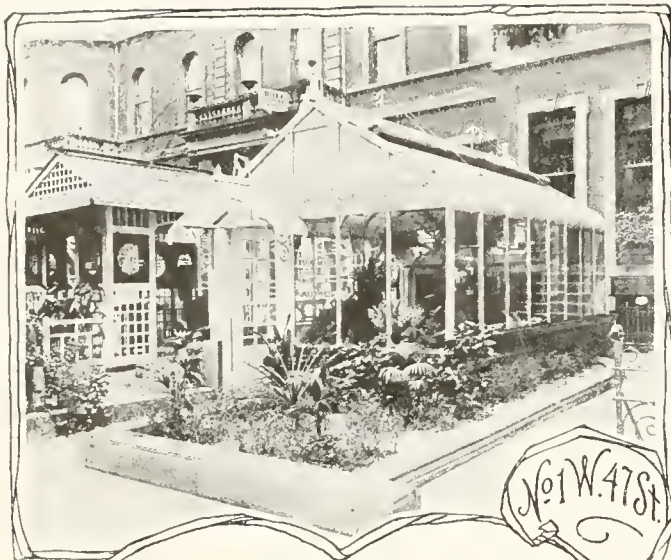
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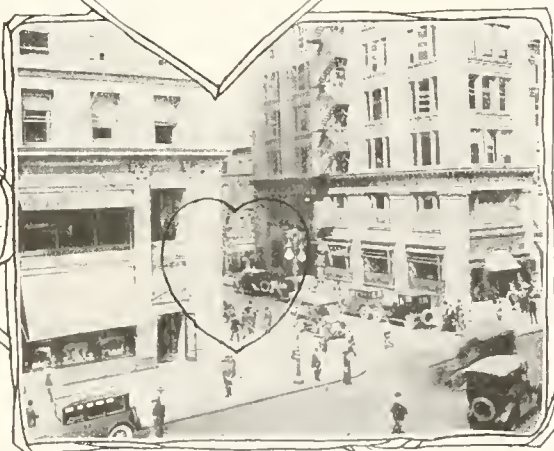
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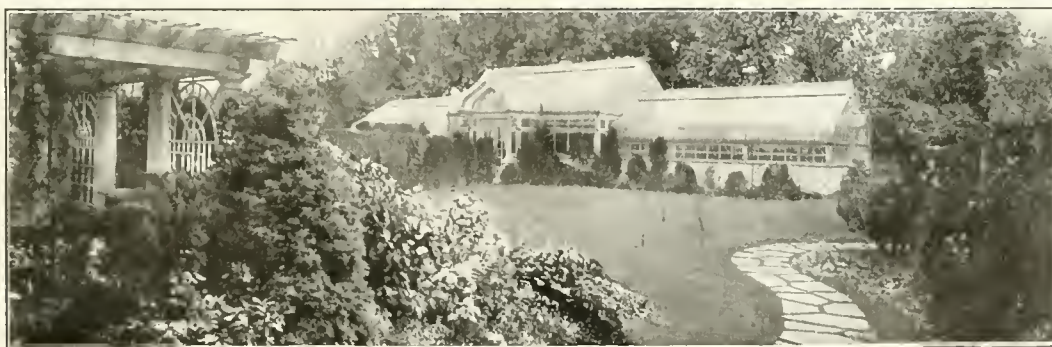
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Things and Thoughts of the Garden

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AT this season of the year many of us are concerned with the problem of providing Winter overcoats for plants that may be expected to suffer from the rigors of Winter if left unprotected. Regardless of the latitude and climate in which gardening operations are carried out there seems always to be a tendency for gardeners to attempt to grow out-of-doors plants which are on the border line of hardiness and which need considerable coddling in order to carry them over the Winter. Whether this is a laudable desire on the part of garden lovers is a moot point.

The most potent argument for growing nothing but truly hardy stock is on the score of the appearance of the garden in Winter, although this will not hold good where the garden is frankly designed and used as a Summer place only.

It is, of course, possible to protect many plants without rendering the garden too unsightly, if the right kind of material is available, and happy should be the gardener who has at his disposal an adequate supply of fir or pine branches to cover and protect Rhododendrons and choice Conifers. But in a garden that is intended for all the year round use, those trees and shrubs that need protection should be taboo, or relegated to a spot where the sight of them will not interfere with one's enjoyment of the rest of the garden. For there is so much of beauty and interest, even in the depth of Winter, that can be enjoyed by those having a seeing eye that it is a sad mistake to clutter up the garden with semi-hardy plants that have to be swathed in unsightly coverings. At this time one can appreciate more fully the beauty and strength of the framework of the deciduous trees and admire the diverse ways in which their branches are disposed in order to secure the maximum amount of light and air for the leaves that they support. It will be noticed that those trees which produce large leaves, such as the Kentucky Coffee Tree and Paulownia, to mention two of a widely diverse type, have strong stocky twigs sparingly produced and spaced far enough apart to support the leaves without overcrowding. On the other hand, in the small leaved trees, such as Elm, Willow, and Birch, the branchlets are small and slender, much more numerous and well adapted to their purpose of displaying myriads of small leaves.

During the Winter one can more thoroughly enjoy the beauty of the feathery tracery of the branches and twigs of such trees as the Elm, especially when they are seen silhouetted against the late afternoon sky. One can enjoy the spectacle presented by the slender, flexible branches of the Babylonian Willow as they are whipped by Winter

gales and the graceful beauty of the white Birch, most appropriately named "The Lady of the Woods."

Their form is not alone in arresting our attention as there is the style of branching, many details of the structure of buds, and coloring of bark and twigs, that call for notice.

Most of the trees can be distinguished one from the other by their habit of growth and it is most interesting and profitable to become proficient in determining the different species by this means. The Lombardy Poplar, with its numerous aspiring branchlets, simulates a gigantic besom, differing from the sturdy, rugged white oak, the symmetrical Linden and compact, stiff-twigged Horse-chestnut, as widely as these differ from each other.

The most pronounced bark coloring is to be found amongst the Birches, but these are not the only trees that exhibit striking coloration. There is the Striped Maple, with green bark handsomely striated with white; the Tree of Heaven, curiously mottled with light and dark gray, in more or less regular patterns; the White Mulberry, with cinnamon brown bark; the Sycamore, grotesquely marked with leprous splotches; and the Beech, with its smooth blue-gray bole.

If one were asked to name the most striking of the trees in their Winter garb, what would be the answer? If the evergreens are excluded the first choice of many would undoubtedly be the Beech, with its massive trunk, well proportioned branches and graceful slender twigs. The coloring of the bark in this noble tree is also noteworthy and produces almost indescribable effect when many are seen growing together in a pure stand. The Sycamore, Plane, or Buttonball, is also arresting, especially when plentifully adorned with its dangling ball-like fruits. The bark of this tree often affords us an approximate indication of the points of the compass, as there is usually much more flaking of the bark from the south side. The American Elm provides a note in the Winter landscape at once strong and graceful. As is well known this beautiful tree occurs in many different forms. Those of the so-called "Vase" shape, in which the trunk divides into several massive branches which swerve outwards in bold curves, are perhaps the most beautiful of them all.

Although it is scarcely possible to find two Ginkgo trees that resemble each other closely, yet their style of branching is so distinctive that in spite of great variety in outline, the greatest tyro experiences no difficulty in at once recognizing them without close inspection. Their habit is unique, possessed by no other tree. Young trees usually have an uncouth appearance, owing to the erratic

way in which one or two strong branches shoot out from the main trunk leaving the rest of it practically bare. As the trees become older a more symmetrical appearance is gained, but without the loss of the straight, rigid, ramrod-like effect of the branches arising at a fairly acute angle from the trunk. The Sweet Gum, *Liquidambar styraciflua*, is another of our striking trees—especially those forms which have peculiar corky ridges along the twigs. Its buds possess a high polish, even when growing in thickly populated centers where they might be expected to be overlaid with city grime. Its pendent fruits remind one of the spiked ball maces used with murderous intent during the middle ages.

Those wishing to delve farther into this fascinating subject will find that "Studies of Trees in Winter," Huntington, or "Trees in Winter," Blakeslee and Jarvis, are useful aids to observation.

* * *

Nature in some of her meteorological manifestations adds much to the beauty of vegetation in Winter. Amongst the phenomena that compel the admiration of all beholders is the ice storm which coats every exposed thing with a sheet of ice. What an alluring place the garden is when the sun breaks through immediately after one of these ice storms! Every twig, every leaf, encased in glittering ice which emits a musical tinkle and crackle as the branches are swayed by the breeze. Although these storms are a feast for the eyes, yet they awaken much trepidation in the heart of the gardener, for, should a strong wind spring up whilst the trees and shrubs are still shrouded in the heavy covering considerable damage may be caused by snapping of the overweighted branches. Much has been written of the surpassing loveliness of snow-laden trees. Here the evergreens possess an advantage over their deciduous brethren in their ability to make an entrancing picture. It can almost be said that no two snowstorms are alike in their effect on the garden landscape. The trees and shrubs exhibit an entirely different appearance after a snowstorm accompanied by wind and a low temperature, and after one of those quiet storms, with the temperature just above freezing point, when the snow is heavy and stays just where it falls. Storms of the latter type are often the cause of serious damage to our cherished evergreens when the snow lodges on their branches and by sheer weight breaks them.

Some ten years ago there was an interesting article in the *Gardeners' Chronicle* (London) on hoar frost and snow in the alpine garden. The article was illustrated with photographs which clearly showed the enchanting, fairy-like effects produced when Jack Frost has his way with the denizens of the alpine garden. The pictures showed seed heads of *Sedum spectabilis* transformed into powder-puffs of snow, and *Sempervivum* and other alpine plants with leaves rimmed with hoar frost. The writer stated that he made a practice of leaving seed stalks on many plants, so that he might enjoy their beauty when transformed by frost or snow from dried-up rubbish into objects of beauty.

* * *

The shrubs in general are not particularly noteworthy for their Winter appearance, but there are some that are so strikingly distinct that they cannot be overlooked. The shrubby Dogwoods with colored stems ought to receive much more attention than they do. A group of *Cornus alba* provides a most pleasant touch of color which is greatly enhanced when the blood-red stems have the snow-covered ground as a foil. *C. stolonifera*, a North American species, similar in appearance to the preceding, which is Asiatic in origin, has a variety, *flacciramca*, with bright

yellow stems which can be effectively used associated with the red-branched forms. This genus contains several other species with colored twigs; notably *C. amomum*, purple; *C. Beileyi*, with reddish stems, and *C. sanguinea*, red. There is a variety of the latter, *viridissima*, with green branches. A most interesting and beautiful planting for Winter effect could be formed by the use of various species of *Cornus* alone, but we are not by any means restricted to this genus.

In sections where very low temperatures are not experienced the pale green stems of *Kerria Japonica* are very effective. Here in Brooklyn the Winters are usually sufficiently severe to kill back the tips, which causes them to turn brown and spoils their appearance.

Many Chinese specimens of *Rubus* introduced to cultivation by E. H. Wilson are unique amongst shrubs in their winter garb. The canes of many of this group exhibit a bluish-white, or white appearance, caused by a waxy exudation on the bark. This is so pronounced in some species as to make them appear as if whitewashed. These are not in general cultivation in America and we need to know more of them as to their hardiness and adaptability to our climate. To many the effects of a clump of these ghastly canes is bizarre rather than pleasing, but to others they are interesting and well worth growing. *R. Giraldianus*, a strong growing species, is amongst the most effective of these white-stemmed *Rubi*. This has the merit of being particularly graceful, as many of the strong canes arch over so that the tips touch the ground.

Many of the Willows exhibit striking coloration of the young twigs, which is usually intensified towards the close of Winter. Indeed, this brightening of their color may almost be taken as the first sign of the coming of Spring. Although some of these Willows could more properly be considered as trees rather than shrubs, yet, when they are grown for Winter effect, it is sometimes desirable so to prune them as to cause them to assume a shrub-like habit. Two varieties of *Salix vitellina* are desirable forms. One, var. *aurca*, has yellow stems, and one, var. *britzensis*, has red stems.

Judicious pruning is advisable with all shrubs grown for twig coloration, as it is the young growths that exhibit it in greatest perfection. Pruning therefore should be carried out with the idea of securing an abundant supply of strong young growth and, of course, should be performed in spring before growth starts.

With the many opportunities of providing interest and beauty in the outdoor garden during the Winter, is it not worth while to endeavor to grasp them and to avoid, as much as possible, marring the effect by unsightly Winter coverings?

There are two kinds of men in the world: those who sail and those who drift; those who choose the ports to which they will go, and skilfully and boldly shape their course across the seas with a wind or against it, and those who let winds and tides carry them where they will. Success of the real kind is always in the man who wins it, not in conditions. No man becomes great by accident. A man gets what he pays for, in character, in work, and in energy.

The only road to advancement is to do your work so well that you are always ahead of the demands of your position. Keep ahead of your work and your work will push your fortunes for you.

Our employers do not decide whether we shall stay where we are or go on and up. We decide that matter ourselves.—*Hamilton D. Mabie*.

Plants for Winter Effect in Southern Florida

E. HEPPLER

THE subtropical climate of Southern Florida, with its rainy season and its mild Winters, offers an ideal home to a great number of plants growing under similar conditions at corresponding parts of the world, which, in addition to the valuable representatives of the native vegetation, are of great service in planting, and, arranged carefully as to their habits and natural requirements, are a ready means of creating pleasing scenes and landscape pictures. It is a task of no difficulty to select out of the diversity of material those trees, shrubs, and plants that in succession give a display all the year round. However, considering the fact that most of the owners of estates spend only Winter and early Spring in Florida, it will be a wiser plan, and of more advantage and credit to the planter, to confine his selection to plants that are at their best during this time. Deciduous trees, shrubs and vines should for this reason be used sparingly or not at all, for, no matter how delightful at their climax, they will be bare in Winter and carry a not very agreeable contrast to the surrounding landscape, the keynote of which should be life and vigor.

There are unlimited horticultural opportunities to secure the desired effect by bringing out the subtropical character of this zone, an undertaking which will always be successful and appreciated. Desirable plants suited for that purpose will be found among the following, which, though it does not comprise everything adapted to this climate, will give a fairly good idea of the material mostly employed.

Palms, the most conspicuous representatives of the tropical flora, are planted here to a great extent and, where properly attended to, splendid results are the recompensation. Well mulched, watered, and fertilized, they develop to stately specimens, their beauty and elegance making them an adornment to any home grounds. An admirable palm for outdoor planting south of Tampa is the Fishtail palm, *Caryota mitis*, which is of rapid growth and whose bipinnated leaves are of a peculiar beauty.

Cocos are generally planted along the coast line and its immediate vicinity, where they do exceedingly well and show their character better and sooner than elsewhere. *Cocos plumosa*, the most striking species, does not object to slight, occasional frosts and is a rapid grower, reaching a height of 30 feet to 40 feet. For street and avenue planting, as well as for arrangements in groups or as a single specimen, it is second to none. *Cocos uncifera* is found in plantations on almost sterile soil along the seashore, where it fruits to advantage, even without an application of fertilizer. Inland, however, it bears very irregularly, and is planted for its ornamental qualities only.

Orco-dora regia, a native of the Everglades, is one of the most desirable palms for the extreme South, where it will grow to a height of 100 feet and more. Its magnificent crown of feathery leaves is supported by a grayish white trunk of immense proportions, which gives the plant its majestic appearance, hence its name, Royal Palm. When grown north of Fort Myers, protection should be provided, as it is not quite hardy, and, though larger palms will stand a light frost to a certain extent, the younger and more tender ones will invariably be injured.

Phoenix is very popular and is difficult to surpass in regard to hardiness and luxuriant growth. *Phoenix canariensis* is undoubtedly the best of all for this climate, as it is of a very vigorous growth and develops to its full

beauty sooner than any other kind of this genus. *Phoenix dactylifera*, the true Date palm, is a somewhat slow grower and is the least shown of all, but specimens of it will occasionally be found. As a rule, better results will be obtained in shorter time with the first-named variety.

Sabal palmetto, the cabbage palmetto, is another native of Florida, and is cultivated abundantly through all sections of the state. It is often used as a street tree and as specimens on lawns and in parks, as it is easily transplanted, and with ordinary care always sure to survive this operation. Immediate effects are secured by planting strong, old plants taken from their native places.

Scaforthia elegans, the Australian Feather palm, is another palm adapted to Florida and deserves a place as well as *Thrinax parviflora*, a fan palm of smaller size, which presents at all stages of its growing period an interesting appearance.

Washingtonia robusta, one of the characteristic street trees of Southern California, has become very popular in this part of the state, and it is freely planted on account of its fast growing qualities.

Of the *Cycadaceae*, the most ornamental plants of subtropical gardens, *C. revoluta* and *C. circinalis* are often met with. They are of half-dwarf habit, quite hardy and do not object to an occasional drought. They are favorite plants for the conservatory, because of their easy culture, and thrive fairly well, even if somewhat neglected.

Next in importance to the various palms are foliage plants; plants that are cultivated more for the decorative effect of their foliage than for flowers, which are usually insignificant. Their chief value lies in the outspoken permanency of presenting a wide range of colors all through the year and they are, if tastefully arranged and not used too abundantly, a very welcome means to set off a background or give a pleasing contrast to the prevailing landscape.

The *Acalyphas* can claim to be one of the most popular plants of this group in Southern Florida. They are extensively planted and have always given satisfaction if not planted on too wet a place. One of their merits is the magnificent coloring which with *A. marginata* is exceptionally beautiful during Winter. Besides *A. marginata*, *A. musaica* and *tricolor* are generally used.

For placing in shaded or half shaded places, no plant can be more highly recommended than *Aspidistra lurida*, which does exceedingly well and responds to such a location, with fine variegated leaves.

Crotons are of a luxuriant growth, attaining considerable height and size. To develop them to their final glory and bring out to perfection those color shades peculiar to them, they must be set in the full sunlight and given a liberal supply of water. An occasional application of fertilizer is also of great benefit, and one need not be afraid of giving them too much.

Colcas, in its different varieties, is extensively used for bedding and in the floral arrangement of vases and window boxes. Although many carry the old stock over, cutting them back and thus growing them for several years, better plants and brighter colors will be had from plants grown from cuttings every year. *Dracena australis* and *indivisa* thrive in the open under ordinary care and are desirable for subtropical displays on account of their palm-like appearance and their ornamental character.

The Screw-Pine, *Pandanus utilis*, and its variegated

form, *P. Veitchii*, are found in great numbers in Southern Florida, and are attractive in all stages of their growing period. As young plants they are useful for vases, table decorations and other purposes where an ornamental effect is wanted: when mature they are very pleasing on lawns, planted either singly or in groups. Fine, nicely branched specimens are frequently found.

Philodendron pertusum, a striking example of a tropical climber, is grown successfully in this State, and the large, perforated leaves seldom fail to attract the visitor's interest. It is an admirable plant for the covering of pillars, arches and trellises, of a rather fast growth and easy culture, and it is deplorable that it is not so extensively planted as its merits deserve.

Phyllanthus nirousus, *roscopictus*, is conspicuous for its brilliant foliage, which, besides green, shows most pleasing shades of white, pink and red. It is a useful shrub for low hedges and shrubberies, and should be cut back severely before the rainy season to induce a bushy, compact growth, as it naturally is of a somewhat straggling habit.

The number of shrubs or trees flowering in Winter or early Spring is limited to a certain extent, for, while most of them bring their blossoms in Summer or early Fall, others of a more tender condition do not grow satisfactorily.

Bauhinia purpurca flowers in early Spring, its blossoms resembling an orchid in shape. It is of rapid growth, evergreen, and does well, even in a soil of moderate fertility, if properly fertilized. *Bauhinia triandra* flowers in the late Autumn and is also interesting on account of its characteristic two-lobed leaves.

Hibiscus rosa-sinensis and its varieties is a very popular shrub and found in almost every garden. It forms excellent specimens of enormous size when planted singly and is also very attractive in shrubberies. The large-sized flowers of the different colors are produced freely all through the year.

Jacobinia coccinea, a soft shrub attaining a height of about 6-8 feet, is an abundant bloomer that can always be depended upon. The flowers are a vivid scarlet and are most numerous in Autumn and early Spring. *Jacobinias* should always be pruned closely, as, when left alone, they grow too straggly and are of a somewhat weedy appearance.

Nerium Oleander is one of the most floriferous shrubs in this zone and commences flowering in the middle of February. The number of varieties is large, ranging in color from pure white to a deep red, and there is hardly a garden that is without at least one plant of this handsome shrub.

Poinsettia pulcherrima presents its fiery scarlet flowers, or rather bracts, with the first days of December, and is a source of enjoyment for a long period. The middle of February still sees them in their full glory and it is March before they fade away. To get the best results it should be planted on well-drained land, pruned closely, and receive an application of commercial fertilizer at least twice a year.

Roses can be had in flower during Winter if a high culture is followed and great pains taken as to the preparation of the soil and selection of the varieties. In almost all cases, however, the efforts will not result in producing the effects that we are accustomed to see in rose gardens in the North or in Europe, as the lack of a dormant season and the different climate provides too many factors completely beyond the control of the gardener.

Of shade trees, *Eucalyptus* have been lately planted on a wide scale and are a ready means to obtain a good

showing in short time. Although they usually prefer a well drained land, *Eucalyptus rudis* has been found to do fairly well on wet ground. Of other kinds, *Eucalyptus robusta*, *rostrata*, and *iminalis*, are largely planted. *E. globulus*, though doubtless one of the most handsome of this genus, is somewhat tender and should be planted only where no frosts are to be feared. The growth of *Eucalyptus*, as a rule, is of an upright character, and results consequently in tall, slim trees, but a bushy specimen of a more compact habit can be had if the tree is judiciously topped several times in its infancy.

The rubber trees, *Ficus*, are desirable as much for their decorative foliage as for their shade-giving qualities, and thrive with comparatively little care. The most popular of all is *Ficus elastica*. *Grevillea robusta* is well liked on account of its peculiar foliage, often being planted as a shade tree. It is rather hardy, fast growing and sometimes attains a height of 100 feet and more. To avoid breakage from wind it should always be cut back closely.

Magnolia grandiflora, the famous broad-leaved evergreen of the South, thrives in moist places and requires a rich, fertile soil and a permanent mulch to grow to perfection. It attains an enormous size, which makes it very desirable for avenue plantings, and it is also well adapted for landscape settings because of its large, fragrant flowers.

Parkinsonia aculeata, the Jerusalem thorn, is a small tree of the order of the *Leguminosae*, the drooping branches of which are literally covered with deep yellow flowers at the time of blossom, as it makes a good defensive hedge and can be used to advantage in shrubberies, its planting should be more encouraged, for it does splendidly, even in dry places.

Poinciana regia is a typical subtropical tree that deserves planting in every garden, were it only for its large, finely-cut leaves which are of a highly ornamental character. In addition, fiery scarlet flowers appear in Spring and it is hard to think of another plant that is so suitable for lawns as this symmetrical tree, with its wide-spreading branches.

Of the climbing and trailing vines planted in this section, none is more esteemed and used for so many purposes than *Bignonia venusta*. It is a prodigious Winter and Spring bloomer, bringing its marvelous clusters of orange-red flowers sometimes as early as Christmas. The plant itself, though delicate and tender looking in its first stages, is of tremendous growth after becoming established, ultimately reaching a height of 50-75 feet when trained on trees. *Bougainvillea glabra* is of a somewhat louder color and should, consequently, be used more cautiously in regard to its environments. Like *Bignonia venusta* it is of fast growing qualities and responds well to an occasional application of commercial fertilizer. The bright magenta red flowers are produced freely during Winter and Spring and often used as cut flowers in vases.

This does by no means exhaust the theme in any way. It is only an enumeration of plants of my knowledge that do well here in Florida under ordinary care and that can be relied upon for Winter effect. Thus I have omitted all deciduous and Summer flowering shrubs and vines that are in their prime in Summer or Autumn, and are of little value and more or less out of place in an arrangement which is to bring out satisfactory, subtropical effects for the Winter season.

Good health, imagination, persistency, and a good memory—and of course keeping everlastingly at it—are the principal requisites for a successful career.—*Samuel Insull*.

The Argument for Wild Gardening

HERBERT DURAND

WILD Gardening may be briefly defined as the use of native trees, evergreen—both large-leaved and coniferous—shrubs, vines ferns and wild flowers, to produce pleasing landscape effects in woodland, meadow and bog, or on barren hillsides, outcroppings of rock, etc. It involves but little construction work, no extensive preparation of soil, and no cultivation or care after planting.

On many country estates there are wooded areas, rock ridges, uncultivated fields, or perhaps marshy spots through which a brook meanders—any or all of which may, with tasteful treatment and the use of native plants, be made the most exquisitely beautiful features of the place. The expenditure involved is surprisingly moderate as compared with other forms of gardening.

Even the home owner with only a small plot of ground suitable for gardening can usually find some shaded spot in which he may enjoy the beauties of many of our native ferns and flowers provided their simple but exacting soil requirements are complied with.

In Wild Gardening are used primarily the plants that are already growing on the premises or are indigenous to the vicinity. These are supplemented by choicer and rarer things that will grow and thrive under existing soil and climatic conditions.

Frequently there are old fields and pastures formerly under cultivation but now overrun with natural growth—old grotesque apple trees, bayberry, dogwood, shadbush, red cedars, huckleberries. Everything of this sort is preserved and utilized, thus very materially reducing the cost of planting material.

Some estate owners are fortunate in possessing a brook, or pool, or perhaps an old millpond which can quickly and inexpensively be transformed into a water garden in which our charming pond lilies, pickerel weeds, irises, arrowheads and other aquatics will flourish, while the banks can be clothed with pussy willows, white birches, alders and other beautiful shrubs under which will thrive moisture-loving ferns and such brilliant flowering plants as the cardinal flower, the closed gentian and the marsh marigold.

A boggy place is an ideal location for azaleas, sweet pepper bushes, wild roses, American holly, the high-bush huckleberry and a host of gorgeous orchids and flowers like the showy lady's slipper, meadow sweet, meadow beauty, many violets, the meadow lily, the turk's cap lily, and even the loveliest of all wild flowers—the fringed gentian, colonies of which may be established in such places by sowing the seed as soon as possible after it becomes ripe in late Fall.

There is a wide difference between the planting of a cultivated garden and Wild Gardening. The former implies plowing, harrowing, grading and raking; then putting in as many vegetable or flowering plants, shrubs or evergreens as the space or stilted plan will permit; then weeding and hoeing, watering and pruning, staking and spraying—altogether an expensive and interminable task. Wild Gardening, on the other hand, involves simply the cleaning up of the place by destroying and removing brambles and briars, rank weeds, dead or unsightly trees and shrubs and other undesirable objects, the intelligent deforestation of thickly growing woodlands and the laying out of paths and trails. This preliminary work accomplished the new planting is, as a rule, confined to spots of special interest because of unusual beauty and convenience, or the presence of some natural feature of

peculiar charm—such as a spring, a striking rock formation, a natural forest glade, or a lovely vista.

And it should be borne constantly in mind that no attempt should ever be made at cultivation or coddling, pruning or spraying wild plants or planting—that here such things as plows and shovels, hoes and rakes, stakes and trellises, must be rigidly tabooed. The upkeep of such gardens is therefore practically nothing. Furthermore, the great majority of our indigenous plants will, by seed or underground runners, propagate themselves and increase and multiply as the years go by, thus adding to the beauty and the naturalness of the surroundings.

The Winter months are best for studying country places and planning wild plantings because of the absence during the Winter of foliage, weedy growths and vines which prevent easy access to and free open views of the areas to be treated. This is also the best season to determine what locations are suited for special treatment, to prepare lists of plants, and to place orders for them, so they will have priority and be forwarded promptly as soon as the Spring planting season opens.

Finally, everyone who establishes in congenial locations, colonies of our rarely beautiful but fast disappearing wild flowers and ferns, is not only providing a never-failing present source of enjoyment but is helping to prevent their extinction and to preserve them in all their refined and delicate beauty for future generations.

AMERICAN WILD FLOWERS

HOMER D. HOUSE, our State Botanist, calls attention to the need of conservation of wild flowers, because, with the increase of automobile traffic, motorists, particularly the thoughtless, have been uprooting, breaking down and gathering these beauties of wild life by the armful for the fleeting pleasure of a few hours.

Mr. House points out that our byways and woodlands, formerly attractive through their wealth of true Americans, become the abiding place of burdock, thistles, mustard, ragweed and numerous other obnoxious aliens. Furthermore, the trouble does not end with the mere change of plant life, but the insects, animals and bird life also suffer a marked change, adding nothing to the attractiveness of the byways and woodlands. The forest primeval gives protection, home and sustenance to a remarkably varied life: it affords shade, recreation and homes to many birds; it shelters shrubs, wild flowers and animals.

Not long ago the State of Connecticut had to place placards throughout the hills and valleys calling attention to the widespread destruction of wild flowers, such inroads being made that the State was being denuded of those plants which, by reason of their size and colors, are conspicuous objects to the ordinary observer. In New York State the trailing arbutus has been especially persecuted. New York has a profusion of wild flowers. The number of wild flowers described and illustrated in "Wild Flowers of New York" is slightly less than four hundred, and this does not include all plants with conspicuous or attractive colorings which might be called wild flowers.

Trailing arbutus, jack-in-the-pulpit, the wild-calla, blue flag, *pogonia*, wild pink, marsh marigold, buttercup, flowering dogwood, mountain laurel and white daisy give pleasure to the observer whether he is hiking or riding, and a little thoughtfulness and restraint on the part of the passerby will make the landscape more attractive for all who follow.—*New York Sun*.

The Cedar of Lebanon

MAUD ROBINSON TOOMBS

FROM earliest Biblical times the Cedar of Lebanon was the symbol of majesty and was held sacred. It is called "the tree of Jehovah planted by His right hand crowning the great mountains," and in the XCII Psalm is the beautiful verse:

The righteous shall flourish like the palm tree:
he shall grow like a cedar in Lebanon.

This cedar is a native of Syria on the coldest part of Mt. Lebanon where it grows at an altitude of 7,000 feet. It is a coniferous evergreen of the larger sort, bearing large roundish cones of smooth scales, standing erect, needles one inch long and thick set. The wood is of reddish hue and very aromatic, reputed almost imperishable and of such bitter taste that worms and bugs cannot endure it. For this reason the ancients used tablets of cedar when they wrote anything they wished to last. They also smeared their books and writings with a juice drawn from cedar to preserve them from rotting. Cortes is said to have built a palace in Mexico in which were 7,000 beams of cedar most of it 120 feet long and 4 feet in diameter. The cedar used in the main mast of the galley of King Demetrius measured 130 feet long and 18 feet in diameter. The wood was in particular demand for religious buildings. King Hiram of Tyre sent it to King David as the most precious material with which to build the temple of Jerusalem.

Its massive trunks, great height and dark heavy foliage, green at all seasons made the forests of Lebanon famous the world over, even in the days of the prophets. Heroes and emperors were likened to the kingly cedar of Lebanon, until it stood for all that was most precious and majestic in trees. The wonderful fragrance of its wood, which never dies away, also made it highly prized.

Some of the giant trees on the slopes of Mt. Lebanon were said to have been planted by Solomon himself, and when Palestine was opened to the Christians in the Middle Ages the patriarchs threatened with ecclesiastical censure those who harmed these venerable old trees by making pilgrimages to them in order to collect wood for crosses, tabernacles and the interior of churches. In this manner, the grove was no doubt saved for future generations, but a scientific investigation conducted by Sir Joseph Hooker, the eminent English botanist in 1860 reported a rapidly diminishing number of trees. Those remaining did not exceed four hundred in number, vary-

ing in girth from 18 to 40 feet, and he found no seedlings or young trees, showing that favorable conditions for the germination of the seed must occur at great intervals. It will be seen therefore how rare and valuable these trees are and how difficult to raise from seed.

In 1863 the cedar of Lebanon was introduced into England, and in the latter part of the 18th century it was brought to this country. It is claimed that there are only five adult specimens in the United States, many of the trees which pass for Lebanon Cedars, both in this country and in England, being the much easier grown and far

less valuable Cedar of Mt. Atlas. The trees in the United States are:

The "Old Cedar" in a field in the northern section of Flushing, Long Island; one on the Prince estate, also in Flushing; one at Woodlawn, Princeton, New Jersey; one on the Collis Huntington estate at Throggs Neck, L. I., and one in Idaho.

The "Old Cedar" has a right to its title as it is the largest and most venerable of the five trees. It has been the object of many pilgrimages from tree lovers all over the country, some coming all the way from the Pacific coast, and with reason, for it is a majestic specimen. It stands at a height of 75 feet, with a diameter of 6 feet, and its lower limbs extend 54 feet. Its heavy and matted branches spread their plane-shaped masses of dark green, both Winter and Summer. The origin of this venerable ancestor cannot be traced but it was probably brought over as a



The Old Cedar of Lebanon at Flushing, Long Island, N. Y.

seedling in Revolutionary times.

The cedar on the Huntington estate was imported by Philip Livingston the former owner of the estate. It is about 70 feet tall.

The Princeton tree was planted at Woodlawn by the late Judge Feld in 1842. It is in the neighborhood of 60 feet.

The tree in Idaho was one of two trees planted from seed brought from the Holy Land many years ago. One tree died, but the survivor—a mere youngster as cedars are measured—is about 40 feet high and has a diameter of about 14 inches near its base.

The Cedar of Lebanon is one of the hardest trees to propagate, and almost every one who has tried it has failed. The "Old Cedar" in Flushing was particularly the subject of experiments and was at last pronounced sterile, as no one had ever obtained results with its seeds. It remained for C. H. Runtleman of that town to experiment successfully with its cones. He loved the tree, made it his hobby, and finally, after many years spent in strug-

gles and difficulties, he found a method of his own, and today he has several thousand hardy one-, two- and three-year-old seedlings growing in his nursery. These seedlings are growing successfully in the Arlington National Cemetery, some as far away as Wisconsin and California. After making the mistake of following the old books on the subject and coddling the baby cedars, and after he



Seedlings Showing Their First Season's Growth

had lost all of his shoots but three out of several hundred he took the opposite viewpoint and put them out of doors in the snow and icy February weather, after which they did wonderfully.

One of the illustrations shows the first season's growth of seedlings, and in speaking of this Mr. Runtleman says: "The four larger seedlings in the picture are 10 to 11 inches high. That is what the seedlings look like from the first season's growth. The little seedling in the center is a white, five-needled pine; it represents a fair growth for the first season. It was grown to illustrate how much stronger grower the Cedar of Lebanon is than the other needled varieties. A tree of this sort can readily attain a height of 36 feet in 17 years.

"The picture showing the cones and blossoms (there are four of these) also gives an idea of the dense formation and compactness of the needles. The blossoms are about one and one-half inches long, and one-half inch in diameter. When they first open they are of a bright yellow color, turning to a rich brown, and they remain on the branches about a month. The three cones are nearly of matured size, are about 4 inches long and about 3 inches

substance which looks like powdered sulphur and smells like resin. It does its fertilizing of the seed bearing cones with its substances in the month of June. The seed bearing cone is a growth and when it is the size of a hen's egg it becomes covered with a very fine woolly-like growth. If the cone is obstructed so that it doesn't receive any fertilizer there will not be any seed in that cone. For instance if a cone happens to have a branch and its needles resting on it that part of the cone will be seedless. A cone which has its full share of fertilizer will bear 150 to 175 seeds. The cone grows from three-year-old wood and it takes two years to grow a cone from the cone bud which grows from the branch. The branch on which it grows is five years old when the cone comes to maturity. Then the cone and the seeds are scattered, but by that time, in this climate, almost all the seeds become rotted by the weather and rain before ready to fall. There must therefore be some plan for taking the seeds from the cone."

Mr. Runtleman is recognized as an authority on raising these difficult trees. In his opinion there is no tree so well worth planting as the Cedar of Lebanon.



Showing Cones and Blossoms of Cedar of Lebanon



Three- and Two-Year-Old Seedlings of Cedars of Lebanon

in diameter, weight about half a pound, and when matured are of a chocolate color. The cones and blossoms stand erect. The blossom of the cedar of Lebanon produces a cone about the size of a nutmeg. It is filled with a

A MAN'S SONG

Sing me a song of a fighting chance,
Of barriers hurled by the hand of Fate
Across the path of the man who dares
Though the whole world mock him:
"Too late! too late!"

Sing me a song of a myriad foes
Grappled and vanquished one by one
By a giant will and a high resolve
To make and keep a place in the sun!

Sing me a song of a man who's a Man!—
Who through the years of storm and stress
Keeps a level head and a gallant heart,
A soul unmarred by bitterness.

Sing me a song of a man and a pal—
Who's learned in the midst of pain and strife
To love his fellows—stretch forth a hand
To the bottom dog on the ladder of life!

For that's the song of a man who's a Man!—
Who laughs in the face of malignant Fate—
On whose brave strength the weakest lean
Till they learn his gospel: "It's *never* too late!"
—H. S. in "Impressions."

DUTCH BULB-GROWING FOR WORLD'S MARKETS

THE bulb-growing dates back to the end of the sixteenth century, when the first Tulips and Hyacinths were imported from the East. The Tulip was at first the object of wild speculation, which finally culminated in the great Tulip swindle between the years 1634-1637, by which many people were ruined. Somewhat later a regular development of the bulb-growing took place, which was extended very much, especially during the last century.

In the Spring, usually about Easter, when the bulbs are in flower, the country presents a magnificent spectacle, and a stranger visiting Holland at this time of the year will not neglect to see the bulb-fields with their glorious mixture of colors. In these fields the Crocuses are first in flower, followed by the Daffodils with their prevailing yellow color; afterwards the Hyacinths with their sharp, strong colors, and later the Tulips with their fine, soft colors. But this flower galaxy does not remain for long, because the nurserymen soon pluck off the flowers with a very small bit of their stems, so that all the strength goes to the bulb. It is the bulb which represents the trade value and not the flowers. These plucked-off flowers which, through their short stems, are of no value, are thrown away into the ditches or sold by children along the roads and in the cities. Later on in the Summer several fields are to be seen covered with the flowers of the tuberous Begonias, etc., and in the Autumn the gladioli make a beautiful show; but all this glory is very little in comparison with that which was to be seen in Spring.

The bulb nurseries are composed of large fields, enclosed by ditches or canals and divided into a number of smaller plots by beech hedges. Every small plot on its own is divided up by one or two main paths into several beds on which the bulbs are to be planted. Very interesting and striking are the large buildings in the nurseries, named "bulb-houses," suitable for drying, keeping, and packing bulbs. These houses consist of two or three floors. Inside are the stands, consisting of a great number of tables on which the bulbs are dried, and between which, by opening the glass doors, the air has free entrance from all sides. Lastly, houses for forcing bulbs and cultivating Amaryllis, Callas, etc., are frequent in the nurseries. Two groups of bulb-growers are recognized, the translation of the Dutch names being the "exporters" and the "growers." Both groups cultivate bulbs, but the latter are small bulb-growers who sell their crop to the former—the bigger bulb-growers—who, with their own cultivated bulbs, send them all over the world.

Here follows a very rough and, on popular lines, short survey of the cultivation and propagation of the bulbs. We commence in September, the time of planting the bulbs on the beds which were prepared a long time ago. The cultivation requires changing the ground every year, so that a field being planted one year with, let us say, Hyacinths, then Tulips or Daffodils, the third year fallow land, or is planted with some vegetables. So there is always land that can be dug up and dunged a considerable time before. After planting the bulbs in lines on the beds they will be covered for the Winter with reed or sometime turf dust against frost as well as blowing away of the sandy soil. At the end of January this cover will be partially removed, being taken wholly away in March. In the flower time, in the month of April, looking after sick bulbs requires much time. The bulbs may be suffering from several diseases showing on the leaves as well as on the bulbs, and the sick bulbs have to be taken away very carefully to prevent infection of the others. Except some diseases, hares, rabbits, mice and crows are the

cause of much loss to the bulb-growers. In the middle of June, after the withering of the foliage, a start is made with the digging up of the bulbs, and after cleaning them from soil they are brought up to the bulb-houses. After being dried in the bulb-houses on the stands, the cleaning, peeling of the young bulbs, and sorting into different qualities is mostly done by women and children, who are allowed by the law to take special holidays from school in this part of the country for working in the sheds.

Besides the natural propagation of the bulbs by seeds and young bulbs produced round the old one, the bulb-growers apply two artificial methods—the cutting and the hollowing—directly performed after the digging up. With a sharp knife several deep cross-cuts are made in the base of the bulb (the cutting) or the whole base is taken out with a knife of special shape (the hollowing), and the wound done over with a little lime. The bulbs operated on in this manner will be put for some time on the stands and planted out in September. The large number of bulbs which develops on these cut or hollowed bulbs have to be taken off the following year, and they are full-grown after three to five years.—*Irish Gardening*.

LIVING CHRISTMAS TREES

AS we approach the festive season when "Peace on earth and good will to men" is the all prevailing spirit that permeates the family life of this great country of ours—living Christmas trees will add a touch of real life to this Christmas spirit. It is only too true that living Christmas trees have not become as popular as they might be, but they are far superior to the cut tree which is thrown away when it has served its purpose, a mere relic of recent festivity. Living trees are now obtainable from many nurserymen and florists, at prices well within the reach of most pocketbooks, and after they have served their purposes during the holiday they may be planted outdoors and become a permanent feature of the home grounds. As the years go by, each adding a tree to the grounds, a new interest will be created, not to mention the sentiment and pleasant recollections surrounding each one.

Living Christmas trees are coming, and it may be of necessity, if we are to have Christmas trees at all. One may read in the newspapers almost every day at this season of carloads upon carloads of trees arriving in our large cities to be sold for Christmas trees, and there is no doubt that the cutting down of large numbers of young trees every year is making serious inroads into the future lumber supply of the nation. It is claimed by those whose business it is to make up the statistics relative to the nation's lumber resources that two-fifths of the total supply has been consumed, and that not more than 40 years' supply remain in the western reserves, where the present supply is being drawn from. In fact the impending shortage is such that one of our largest railroads is already importing its requirements.

Serious consideration is being given by the governors of lumber producing states to reforestation of the principal sources of supply.

There is, of course, a more or less constant supply of material available every year for use as Christmas trees from "thinning" out the forests, in order to give better opportunity to more vigorous trees, but, unfortunately, the cutting down of this surplus material is not always done with proper supervision, and thousands of trees that would eventually add to the nation's wealth are improvidently cut down.

Lilacs (Syringas)

ARBORUM AMATOR

THE shrubs which are commonly called Lilacs really belong to the genus *Syringa* and those which are generally called Syringas belong to the genus *Philadelphus*. However, the name Lilac is deeply entrenched and nearly everyone except the botanists calls a *Syringa* a Lilac, and probably always will, but in this article we will call them by their correct botanical name, *Syringa*, though in our headline we are using the popular name, Lilacs.

The *Syringa* belongs to the botanical order, *Oleaceae*, of which the olive that bears the olive fruit of commerce is a member. There are about a dozen species of *Syringas* and several varieties of each species. Some bear single and others double flowers. Many have a pleasant odor, but some are scentless, characteristics which we should note when making a selection for planting. The flowers have a large range of colors, from pure white to dark red. The species are natives chiefly of Northern China, Manchuria, Afghanistan and the Caucasus.

SPECIES AND VARIETIES

Syringa vulgaris is the common *Syringa*, as its name *vulgaris* signifies. If we are looking for really old-fashioned shrubs, this is surely one. Indigenous from South-eastern Europe to Caucasus and Afghanistan, it was brought into England in 1579 and later it came into the Colonial gardens in America, being one of the earliest shrubs planted in these. Not long after it was introduced into the towns and countryside and became a farmhouse dooryard shrub, and later still escaped to the roadsides. May we say right here that even in these present days for the countryside *Syringa vulgaris* is a desirable shrub. It has an upright growth, bright green foliage, and attains a height of 15 to 20 feet, sometimes, when grown in tree form. In May it produces large panicles of lilac-colored flowers. Some of the original forms of *vulgaris* are *alba*, with white, *purpurea* with purplish-red, *carulea* with blue, and *violacea* with violet-lilac flowers, and, perhaps, *Marleyensis*, and *Charles X*.

Syringa villosa reaches a height of about 7 feet; it has a bushy form, and strong, upright, round, warty branches. It produces in May whitish or pinkish lilac flowers which are nearly odorless. Its several varieties are *aurea*, whose foliage has a yellow variation, *emodi*, which is too tender for the North, and *rosea*, with pink flowers.

On the bank of a Transylvania river there was discovered by the Baroness Josika a *Syringa* which was in her honor named *Josikea*. The violet-colored flowers of this species also are almost without odor, but this species is valuable because it blooms late, its flowers appearing in June. It has an upright habit of growth, reaching a height of about 10 feet, and dark green foliage. There are two varieties of *Josikea*, *pallida*, with pale violet, and *rubra* with reddish violet flowers.

Among the more graceful species is *Syringa pubescens*, reaching a height of only about 6 feet, and clothed with dark green handsome foliage. This native of Northern China produces in May on slender quadrangular branches not large, but quite numerous panicles of fragrant pale lilac flowers.

Syringa oblata forms either a small tree or a shrub of about 12 feet in height. Its foliage is dark green, but instead of dropping in early Autumn, as that of nearly all Syringas, it remains on the branches till November, and assumes a vinous-red color. It is, like most Syringas, a May bloomer, and in that month produces loose pyramidal

racemes of very fragrant purple-violet flowers. This species also comes from Northern China.

Still another native of Northern China is the very distinct species of large growth, *Syringa Pekinensis*. This grows about 15 feet high and has slender reddish branches, upon which are borne in pairs in June yellowish-white flowers in large panicles. This species comes into bloom rather late, but has the valuable habit of retaining its foliage till late in the Autumn. *S. Pendula*, a variety of this, has slender drooping branches.

Syringa Chincensis is believed by some to be a native species from China, but by others to be a hybrid of *Syringa vulgaris* and *Persica*, originating in 1777 in Rouen, France. It has a bush form, is about 12 feet high and on its slender arching branches appear in May numerous flowers of purplish-lilac color in large panicles, which have too pronounced a fragrance to suit some. There are several varieties of this, *duplex* with double purplish-lilac, *alba* with white, *Mertensis* with pale purplish, and *Sougeana* with purplish-red flowers. *Chincensis*, like *Pekinensis*, does not come into flowering young.

There is one *Syringa* which has a distinctive tree form. This is *Syringa Japonica*. It has a pyramidal shape and grows as high as 30 feet. This is a free and a late bloomer, producing in June and July, yellowish-white flowers in panicles a foot long. The foliage of its variety, *argentea*, has a silvery white variegation.

THE HYBRIDS

Syringa hyacinthiflora plena is a double form, a hybrid of *oblata* and *vulgaris*. This is one of the older hybrids, but from this and the varieties of *vulgaris* many of the new double-flowered varieties came. The purplish hue which *hyacinthiflora plena* assumes in Autumn enhances its value as a shrub.

The botanists and horticulturists, chief among these M. Lemoine, of Nancy, France, have carefully studied the species and varieties and by crossing and recrossing these have produced a new race, so to speak, of both double and single flowered Syringas of great beauty. We will mention briefly a few of these single-flowered Hybrids: *Syringa rubra insignis*, rosy purple; *Ludwig Spach*, purplish red; *Charles X*, dark lilac-red; *Philemon*, dark purple; *Aline Mocqueris*, dark red; *gigantea*, bluish-red; *Doctor Lindley*, pinkish lilac; *Geant des Batailles*, bluish lilac; *Sibirica*, purplish lilac; *Gloire des Moulins*, pale pink; *Lorainiana*, light pink; *Frau Bertha Dammann*, and *Marie Legraye*, white.

DOUBLE FLOWERED HYBRIDS

President Carnot, lavender flowers with white centers; *La Tour d'Auvergne*, violet purple; *Comte Horace de Choiseul*, a magnificent lilac purple variety; *Dorcen Keteleer*, lilac blue; *Condorcet*, blue; *Belle de Nancy*, pink with white center; *Charles Joly*, one of the darkest of the purplish-red varieties; *Leon Simon*, considered one of the best, pinkish, changing to bluish lilac; *Lemoinei*, lilac pink; *Jean Bart*, pinkish violet; *Lamarck*, loose panicles of large violet flowers; *Michel Buchner*, very large and very double pale lilac flowers; *Virginite*, white and pink; *Madame Cassimir Perier*, large white flowers borne in graceful panicles; *Marie Lemoine*, large white flowers in dense panicles; *Madame Abel Chatenay* and *Obelisque*, white. These lists are far from exhaustive, but embrace some of the best hybrids.

Double-flowered Syringas are usually of dwarfer

(Continued on page 401)

The Month's Work in Garden and Greenhouse

HENRY GIBSON

Winter Protection

While a great deal of harm is not infrequently done by covering up the hardy plants too early, yet when December is passing on there is not likely to be much damage from premature covering. At this writing we are having mild weather in many sections of the country, but this may pass overnight, and the most should be made of every available opportunity to get the Winter covering into place.

It is not usually during the early part of the season that stock suffers for want of covering. It's the first three months of the year that the damage is done.

Dry leaves and straw make the best covering for most plants. Heavy wet manure and like material is to be avoided for mulching. Dry leaves covered with sufficient manure to hold them in place is as good as anything, excepting, perhaps, salt hay, where it is available. For small seedlings recently transplanted, a little brush, in, among and over the plants before the leaves go on will prevent damage when the leaves get wet and weigh down on the plants. The lighter the covering the better the chance the plants have, especially during a mild Winter.

With plants like Phlox, Aquilegias, and Pæonies, it does not matter so much, as these subjects have no growths above ground, and any one of them is benefited by a heavy mulch of well rotted manure, to be dug in in the Spring.

Others like *Iris*, *Coreopsis*, Shasta Daisies, Pinks, Campanulas, and Primulas, cannot stand such treatment. Light covering is of benefit to most plants, but there is every bit as much danger from too much as too little.

All evergreens that are likely to have their branches broken by being weighted down by heavy snows should have a string around them. As soon as possible after a heavy snowfall they should be gone over with a long pole, and the snow shaken from them.

Winter Preparation

A good stock soil leaf mold and sand, for use during the Winter, should be put in without delay. Breaking through several inches of frost in order to get soil in Mid-Winter is not an undertaking that is any too well relished by most gardeners, whether they be amateur or professional. Nor is it necessary, when it can be obtained by a good deal less effort before it freezes up.

Newly fallen snow should be removed from frames, if they have not frozen through, as the growing plants within soon damp off if allowed to remain in darkness too long. Decaying foliage should be removed from lettuce, parsley and violets.

Flats, Bean Poles, Pea Brush, should be gone over and the stock replenished as circumstances permit. Vegetables and fruit in storage should be gone over at frequent intervals, and any decayed specimens removed. The Summer flowering bulbs should be likewise treated.

In the Greenhouses

Seeds of Calendulas sown now will start to flower in March, when planted out on a bench in a carnation house temperature. They will be at their best round the Easter holidays, when something in the

way of variety is appreciated. Give them good, rich soil containing plenty of well-rotted cow manure, as they are gross feeders, and under generous treatment they are prolific bloomers.

A plant that is worthy of more general cultivation is the new *Salvia* "America." It blooms well in the Fall, and is very decorative. It grows to a height of 15 inches, with the flower spikes thrown well above the foliage, and bids fair to become the leader among the dwarf salvias. It increases readily from cuttings, and those who have a few plants will do well to pot them up, and root as many cuttings as needed during the Winter. It is easily raised from seed which has been on the market for the past two years.

Gladiolus is one of the most useful bulbs we have for adding variety to the supply of cut flowers during late Winter and early Spring. It forces readily and as it does not occupy much room can be grown where other plants cannot. It takes anywhere from 12 to 15 weeks to flower bulbs that are planted at this time, but the later in the Winter they are planted the less time it requires for them to bloom.

They are adaptable for culture in pots, one bulb to a 4-inch pot, or three to five, according to size, to a six-inch pot, or where enough head room is available they are admirably adapted for planting between crops of violets, pansies, forget-me-nots, etc., without interfering materially with these crops. The soil should never be allowed to dry out or blind buds will be the result. As the buds appear a bi-weekly application of liquid manure will greatly benefit them.

During the short, dark days, when heavy firing has to be done, more attention will have to be paid to watering. No good gardener has any regular days for watering; it is a matter of being on the lookout all the time, with the watering can or hose nearby at all times. Best results are obtained with greenhouse plants, grown with artificial heat, by keeping them fairly moist at all times.

Grown along without a check, perfect plants are possible, whether it be Begonias or Primulas; in fact, any kind of plant; but when the leaves hang over the sides of the pot a few times, and raw drafts allowed to strike them, the results are soon visible. On the other hand, the soil they are growing in does not have to be kept saturated all the time. No hard and fast rule can be laid down for watering; only actual experience and a critical eye for dry places in the bench, or dry pots can be a sure guide. Heating pipes below and along the sides of the benches cause them to dry out unevenly, and one soon comes to know the spots that dry out quickly.

Excess moisture is always to be avoided, but should the atmosphere appear dry soak the walks and below the benches with water. Almost all soft wooded plants when making growth demand a moist atmosphere, and when they don't get it there is sure to be trouble. Pot plants that are growing actively and that don't need watering once a week should have the drainage examined, for something is likely to be amiss there.

Carnations are always best watered in the forenoon so that the foliage will be dry by evening, though the up-to-the-minute plantsman seldom wets the foliage at this time of the year when watering. Put the end of the hose in

between the plants and let the water run gently. A good method is to have a piece of extra hose about a foot long attached to the regular hose. Cut this short piece, or rather split it down about three inches, and flatten out the end to a level surface, and hold it in this position by a piece of stout wire, passed under it and the ends bent over the two cut edges of the hose. As the water runs over this flattened surface it will spread out into a flat thin stream that will not wash the soil, and saves one the necessity of having to break the force of the cold water with the fingers, a none too pleasant task, when it has to be kept up for any length of time in very cold weather.

House Plants

House plants need more attention during the Winter months, under the conditions that obtain in the average home when the furnace is running. The dry arid atmosphere usually created is anything but beneficial to them. Some heating systems are worse than others. Hot water heat is the best for the average home, not only for the plants, but for the members of the family. Steam gives off a dry heat, but it is to be preferred to that of an hot air system. The heat of the latter will cause the skin and throat of persons in the rooms to feel dry and parched, hence growing plants that demand a humid atmosphere have a hard time to survive such conditions. Something can be done to alleviate this, however, by placing vessels about the rooms containing water. A pan of water set over the kitchen range will keep the atmosphere there moist, but generally water for one thing or another is usually being boiled, so any special effort is hardly necessary. We know of one enthusiastic lover of house plants, who was blessed with a hot air heater, who conceived the idea of placing a pan of water inside of the wall register. The pan was a little narrower than the opening through which the heat came, but long enough to be placed in position, and as the heat made its way up it had to pass round the side of the pan and over it. In doing so moisture was carried along at the same time, which did much to relieve the dryness of the atmosphere in the room.

Flower vases and other receptacles filled with water and set round the rooms will serve a like purpose, though not so effectively, and the real purpose of them need not be known. Watering under Winter conditions in the home will need careful attention, since the plants are bound to dry out quicker, and when water is given it should be given copiously, and not again until the plants again show signs of being dry again. About as good a way as any is to take the plants to the kitchen sink and set each one in a pail of water in turn, until it is thoroughly saturated, then set it on the drain-board to drain. Evergreens of small proportions that are readily handled may be syringed off while at the sink, care being taken not to use enough force or volume of water to damage the plants.

Saucers or jardinières used to set plants in for purposes of cleanliness or adornment should never be allowed to stand full of water for any length of time.

It is true, of course, that moistening the atmosphere of the room is accomplished in this way. The hole in the bottom of all plant pots is not only for purposes of drainage, but also to permit the air to pass more freely through the soil, and when saucers and other receptacles are allowed to stand full of water air cannot circulate, and the plant suffers. Moreover, water standing around plants in this way soon emits an odor that is far from entrancing, and particularly is this so with deep jardinières.

Cleanliness is, of course, essential. It is just as necessary to dust the leaves of the plants every day as it is to dust the piano. Plants breathe much the same as do human beings, and if their leaves are covered with dust

they cannot properly perform this or the other functions they must carry on if they are to flourish.

During the not far distant holidays thousands of plants will find their way into the living rooms, that have been grown in the genial atmosphere of the greenhouse, ideal conditions suited to the needs of the respective plants have been maintained, and it is not a matter for surprise they soon show resentment in heated rooms. Don't be all attention and kill them with kindness, but study the plant, keep it clean, give it water when dry, and then thoroughly. If it is a hardwood plant like *Erica*, for instance, don't keep it in a room where the thermometer runs up to seventy degrees night and day. A cooler room will suit it much better.

LILACS—SYRINGAS

(Continued from page 399)

growth than single-flowered varieties, and of more compact form; they flower less freely, but their blooms keep longer before fading. The panicles of flowers are not as a rule placed as gracefully on the branches as are those of the single varieties.

SOIL AND LOCATION

Syringas, except the variety *emodi*, are hardy in the North. They will flourish either in full sunlight or in a partly shaded place. While they will grow in almost any soil they prefer one that is rich and moderately moist.

CULTURE AND PRUNING

Applications of bone meal several times during the Summer raked in lightly and a mulch of stable manure in late Autumn will help to increase the number of buds and size of the flower clusters. After the flowering period is over the dry flowers and seed pods should be removed, and such pruning as is necessary to keep the bush or tree in the desired form should be done directly. Avoid Winter and Spring pruning. Transplanting may be done any time after the foliage drops in Autumn, when the ground can be worked, until Spring.

PROPAGATING

Syringas may be propagated from green cuttings placed in frames under glass in Summer or from ripe wood taken in Winter and placed upright nearly to the tops in boxes of moist sand in a cool cellar or pit, and from thence transferred, after they have formed calluses, to the garden in the Spring, or new plants may be obtained from root cuttings handled the same as ripe wood; also from suckers, or by layering, or by grafting on stocks of *Syringa vulgaris*.

DISEASES AND INSECTS

Syringas are generally free from injurious insects and from diseases, but sometimes the species *vulgaris* is injured by a borer, *Trochilium denudatum*, which lives within the branches and stems. This rarely attacks other species or varieties, and can be destroyed only by the use of a knife or sharp pointed wire, or by burning the affected parts.

In late Summer or very early Autumn a fungus, *Microsphaera alni*, sometimes comes upon the foliage of the species, *vulgaris*, *Chincensis*, *Persica* and *oblata*, resembling a covering of meal. Other species are seldom affected with this. This disease can be remedied by spraying with some efficient fungicide.

Decide your future—determine that you desire something more intensely than you have ever wanted anything before in your life—and then, work hard, work persistently, to accomplish or attain your desire. Realize that success is largely made up of three ingredients: determination, persistency, and hard work. And of these, the last is the most essential.—*Sparks*.

A Lesson on Plant Physiology and the Plant in Relation to Its Environment

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

WE called attention last month to plant cells, and in mentioning that the starting point of a multicellular plant's separate existence that reproduces itself from seed, is the fertilizing of the ovule in the ovary (fruit) situate at the bottom of the pistil, by the pollen produced by the stamen, we might have added that this is practically the union or fusion of the female cell in the ovary with the male cell of the pollen.

Not only are plants, as we previously stated, so many chemical laboratories engaged in the manufacture of all kinds of chemical bodies, but each living cell is itself an individual laboratory, and is the seat of all those complex chemical and physical changes, and energy transformations, which are the cause of a plant's growth and development.

In unicellular plants the cell is a complete and distinct unit, acting independently; in a multicellular plant, while responding also as a complete unit, a cell works in co-operation or in unison with other cells associated together. There is not only co-operation among cells, but also organized division of labor, and this has become developed to such an extent that certain cells have special activities and each cell, or co-operative group of cells, carry on their particular part connected with the growth and development of the plant and with all the functional activities associated therewith, side by side with others whose occupation is something entirely distinct, and this under conditions which show that there is something more than physical force behind their activities. Marked examples of this are seen when the formation of hard seed-cases (testa) synchronizes with the development of a watery pulp, like, for examples, the fruits of the peach and the melon. Also, in connection with plants having woody stems, we see the cambium consisting of a continuous layer of growing cells full of protoplasm, and the formation of the wood-ring or seasonal growth on the inner and that of the bark on the outer sides of the cambium.

Fertilization results, we repeat, in the union and fusion of two, single, sex-cells (gametic), one being derived from the pollen grain and the other from the ovule. These have been previously differentiated by a series of special developments, and when derived from different plants, or from different species or varieties of plants, the characters of two individuals are fused and two, more or less extensive, lines of ancestry are brought together into one cell, the fertilized egg, which will develop into the embryo of the seed.

Ample provision against the death of any race of plants is made in the act of reproduction. Although reproduction appears to be useless to the individual and even entails upon it not only serious losses of matter and energy, and in annual plants especially, death itself, yet to this function every part of the plant directly or indirectly contributes. The reproductive cells are carefully prepared, are provided with a stock of food sufficient for the earliest stages of development, and are endowed with the peculiar powers and limitations of each species which influence their life-history at every step, and are by them transmitted in turn to their descendants. They are living portions of the parents detached for reproductive purposes and they contain a share of cell protoplasm directly descended from the original protoplasm from which the parent came. In short, we are caused to believe that reproduction is the supreme function of the plant.

It is a wonderful fact that living things have this power to detach from themselves portions or fragments of their own bodies endowed with fresh powers of growth and development and capable of running through the same cycle as the parent. There is therefore an unbroken continuity of the germ-plasm from one generation to another that forms the physical basis of inheritance, and upon which the integrity of the species depends. Living things never arise save through this process, or through a process which practically amounts to the same thing. In other words, every bit of existing protoplasm is the last link in an unbroken chain that extends backward in the past to the first origin of life, or of the life of the particular race to which it belongs. Whatever theory we may hold as to the origin of life—and no scientific statement of this origin is possible—the fact that today spontaneous generation is non-existent has been so well proven as to be beyond discussion.

While as a general rule the embryo of a seed cannot exist

without the fertilized egg-cell being previously brought into existence, still cases are not uncommon where seed is produced capable of giving rise to plants without fecundation. This phenomenon is called parthenogenesis and is said to be characteristic of some forms of dandelion, hawkweed, yarrow, etc.

Reproduction without immediate fertilization is a well established occurrence during part of the lives of certain insects and other lower animals. Aphids, for example, at some periods produce by what is known as "budding off", full-grown, sexless individuals, without fecundation. A more generally known case, and also perhaps the most marked is in connection with the hive bee. Without fertilization the queen bee will produce fertile eggs which, however, only give rise to drones. After fertilization eggs giving rise to worker or neuter bees only are produced, and we believe that in no case is a queen bee naturally produced from an egg. Queens are brought into existence artificially, we may in a sense say, by the neuter bees commencing to feed larvae immediately after the eggs hatch with a special kind of prepared food and continuing this feeding throughout the larval stage and at the same time giving these larvae a special environment.

While parthenogenesis in flowering plants is not of great practical importance, it is mentioned as being an interesting exception to the general rule, and it may be said to be the invariable method of reproduction among the majority of flowerless plants.

Among flowering plants, however, as also among the insects mentioned this method is not continuous, but alternates with fecundation, and is sometimes described under alternations of generation.

In the embryo, the inherent characteristics and possibilities for development possessed by its parents, and to a minor degree any variations acquired by either or both of them, are fixed, and every plant grown from seed and spores has a certain definite and changeless character which was inherent in the embryo from which it sprung, which character is made up of different tendencies, potentialities and limitations of development, inherited in different and varying degrees from each of its ancestors for an indefinite number of generations, plus more or less influence exerted by climatic and other environmental conditions affecting the development of the seed-producing plant. Invariably the influence of the immediate parents is the predominating one, but sometimes a transmitted characteristic or characteristics of an ancestor, which have remained dormant or repressed for many generations, appear in such a way as to materially change for good or evil the character of the plant.

It is this general faculty for transmitting the characters of its parents possessed by the embryo of the seed which renders possible the improvement of plants by selection and hybridization, and also the maintaining an improved variety in its higher state.

It must be borne in mind that practically all our garden plants raised from seed have come from a wild type and in many cases few would recognize that type as being botanically the same as its garden representative. How strong is the pull of ancestral germ-plasm is shown by the tendency of improved varieties to revert back to the original wild type. While this tendency works more quickly in some species than in others, it is only through continual re-selection and elimination (roguing) by seed-growers that the standard of improvement is kept up and increased.

What are known as "stock-seeds" are grown by seedsmen upon their own farms under rigid supervision so that each variety may be of the highest standard of purity and excellence. These stock-seeds are subsequently given out to men who make a business of growing seeds under contract and the seedsmen giving out the stock receives the whole of the produce. There are probably not many more, even if as many, than a hundred seedsmen in the whole of the United States who produce their own stock-seeds. The production, as apart from mere selling, of really high-class seeds is very expensive and requires a considerable outlay of capital. Seeds of this character must be sold at a higher price than those raised at a much less expense, but they are always cheaper than those of inferior quality, whatever price is paid. Seed selection is of the greatest importance and no gardener can really afford to be indifferent as to the quality of the seed he sows. It is not enough that the seed be plump and of a high standard of germination; it should be from care-

fully bred varieties and should contain in the protoplasm of its embryo potentialities for producing the highest possibilities of its kind.

During recent years commercial seed growing has assumed large proportions and has become almost strictly localized; that is, the growing of certain kinds of seeds is confined to one or two localities. This selection of localities does not appear, however, to have been as a whole brought about because of any advantages the region may possess with respect to the maintenance or development of desirable hereditary qualities, but more because of cheapness of production in that locality and the effects of the conditions upon maturity and curing.

Perhaps the most striking instance of localization is that of the Santa Clara Valley, California. This region has a great reputation for seed-growing mainly because of the relative certainty in the prevalence of uninterrupted dry conditions during the period covering the maturing and the harvesting of seeds. Among numerous other kinds, many hundreds of acres of sweet-peas are grown for seed in California; but the question arises as to whether that locality does or does not produce the best possible seeds for *out-door* work in the Northeastern States? Judged by all factors of plant physiology relating to the development of desirable hereditary qualities, it would appear that the climate of the above region is not the most suitable for the purpose, because it may in general be taken as a physiological fact that *seed should be grown under as near as possible the same environment as the crop grown from it will have to occupy.*

Further, many gardeners have been for some years of the opinion that there has been a marked change for the worse in the results from some seeds continually produced in California, especially has this been so in connection with the onion and radish, the former showing considerable deterioration in its keeping qualities.

Attention has been previously called to the fact that seeds inherit the constitution and characters of their parents, it therefore follows as a matter of course that seeds from plants grown in a particular environment will themselves produce plants more suited to a similar environment, and less suited to a more or less opposite environment elsewhere. It is a well known fact that the same variety of corn grown in the South and sown side by side in the North with the same variety from seed produced in the latter district, will mature very much later, even if it matures at all.

The advisability of gardeners producing their own seeds has frequently been considered. In a general way this is scarcely worth while, and is in the majority of gardens impracticable under proper methods. There is, however, little doubt that the growing of purer and better strains of the kinds best suited to one's own local conditions and environment may be made of great practical value by those having sufficient room and who understand the principles of plant breeding and seed selection.

A not uncommon practice is to save seed from "left-overs," or from plants that have run to seed more or less prematurely, and which are useless for table purposes. The only result of this method is to deteriorate the quality of the strain, and, if continued over a series of years, to produce worthless varieties.

In saving seed it is of the first importance to have clearly in mind what are the ideal characters of the plant from which seed is required, and out of the plants one has, to select the best or those which approach the ideal the most closely.

A row of spinach sooner or later runs to seed and is of no further use; but it frequently happens that there are one or more plants in a row which do not commence to throw up flower heads until some time after the others. If these latter are allowed to remain for seed while pulling up all the rest, we shall be saving seed from those standing the longest, which is what is required of spinach. From this stock-seed more seed can be produced and if selection of the longest-standing plants is again carried out and continued year after year the long-standing characteristic of the strain will become more pronounced as years go by. This same principle can be applied to any plants grown from seed in connection with any special characteristic which makes particular individuals stand out as being better than others, and in all cases seed should only be saved from the best, and in some cases the best one has are not good enough to save seed from.

The fact that all cultivated plants have had wild ancestors has been previously alluded to, and with some exceptions the wild types are still to be found although they have been domesticated since before the dawn of history. However long the period during which cultivation and selection has been going on, plants today have retained in their cell protoplasm, potentially or actively, the specific characters of the respective types from which they have sprung.

Some thirty or more years ago Weismann brought out very clearly the fact of the continuity of the germ plasm. By saving seed from plants with more pronounced features in certain desirable directions, and at the same time by giving these plants more

food and other things calculated to improve them, undesirable characters become suppressed by better ones. It must be remembered that before any visible betterment of the constitutional characters of the growing plant can be obtained, such betterment must be produced in the protoplasm of the cells, and there is more or less a kind of competition going on in the cells between what may be called the germs of good and bad characters. It is only by constant selection and attention to breeding from the best that bad characters are kept suppressed and good ones strengthened. As it is, "throw-backs" are common and the elimination, or "roguing" of these is one of the necessary and continual operations of high class seed production.

The acquired characters of cultivated plants do not cause any fundamental or specific change in the germ-plasm; it is therefore very easy by want of care in seed growing, coupled with poor environment, for seed stocks to run down, and in some cases, as pansies for example, they will revert to their wild types in a few years.

Improved varieties of fruit and other trees are sometimes the result of bud variation or "sports" which have been propagated by vegetative process, such as grafting, (to be more fully discussed later) and not by seed. Plants from seeds of apples, etc., invariably produce fruit little, if any, better than the original wild type, although it does happen, perhaps once in many thousands of times, that a variety arises from seed that is worth while cultivating.

This reversion to the original wild type is equally as possible among animals.

Our improved varieties of domesticated animals are, as with plants, the result of the combined influences of selection and of better environment, and a discontinuance of these influences would sooner or later result in the production of comparatively useless mongrels and a complete reversion to their originals. Darwin emphasized this when he pointed out that if specimens of all the varieties of domesticated pigeons were together turned loose upon an island far away from any other land and the incursions of other pigeons, they would in a few years revert to the wild Blue Rock Pigeon from which the various kinds of domestic pigeons have been selected and bred. A very striking assertion which is really a proof of the impossibility of the origin of species by natural selection.

The improvement of plants and the production of new varieties by hybridizing is quite a different proposition from selection alone. Strictly speaking a hybrid is the result of the interbreeding of two different species. The term is, however, frequently used in a broader sense as covering the offspring of a cross between two distinct plants, whether they are merely different varieties of the same species or belonging to different species.

The tendency of systematic botanists is to multiply both genera and species. Were the zoologist to adopt the same methods as the botanist, he would class the puny, woolly Shetland pony as a different species to the Arab horse, whereas there is no specific difference between them as they are merely two varieties which have resulted mainly from living under extreme differences of environment for many thousands of years.

It almost goes without saying that some species are more closely allied than are others in the same genus. The closer the alliance between two distinct plants the easier is it to produce hybrids from them; and even when hybrids are produced they themselves are often sterile and in this case the hybrid cannot be propagated from seed. The further apart two species stand in relationship to each other the greater is the likelihood of a hybrid from them being sterile.

The same thing occurs in animals. Hybridizing the horse and the ass results in the mule which is always sterile; this is another fact disproving the Darwinian theory of the origin of species. With plants, however, we have the before mentioned method of vegetative propagation whereby sterile hybrids may be increased.

The method of artificially hybridizing plants is to remove the stamens before the pollen is formed from the flower of one, (emasculation); and when the pistil of that flower is mature, convey to it the pollen from a flower of another plant, the character of which it is desired to incorporate with the other. The flower of the plant it is intended to pollenize must be continually kept covered with a bag so as to prevent insects or wind conveying undesired pollen to it.

It is not always that the combination of characters desired from hybridization appears in the first generation, in fact it may be taken as a general rule that one must wait until the second generation before the expected result will appear. In times gone by hybridizing was conducted more or less in a haphazard manner, but the researches and experiments of Mendel, De Vries, Correns, and many other investigators, have to a certain degree developed a science of heredity upon the principle of which more exact hybridization has been based to an extent which twenty years ago there was no conception. The principles underlying scientific plant-hybridization have received the generic term Mendelism.

(Continued on page 406)

Departments of Foreign Exchange and Book Reviews

NEW ROSES

New Roses are always the most popular feature of the National Rose Society's shows. No fewer than 19 varieties were submitted to the Committee, but, exercising a wise restraint, they awarded only two Gold Medals and three Certificates of Merit. Opinion was divided as to whether one at least of the certificated varieties should not have had the highest honor, but all seemed agreed as to the Gold Medal Roses. In respect to this, it was interesting to note that the several varieties on view, which had previously been certificated received no further mention, and indeed, as shown their merits did not warrant further recognition.

Courtney Page.—This will undoubtedly be a great Rose of the future, for it is the finest crimson H.T. Rose that has yet been shown. The bloom is of perfect, full form and of large size without the slightest suggestion of coarseness. The rich crimson color has a fascinating darker shading in the "heart" of the flower, which has a sweet fragrance, and it possesses sufficiently long, stout stalks.

Una Wallace.—This is another excellent H.T. Rose that should have a great future, and it is also of splendid shape with large size. It is recommended for all purposes. The color is a beautifully clear, cherry-rose, and the variety is said to be unusually free flowering. Both of these Gold Medal Roses were raised and shown by S. McGredy & Sons.

Certificates of Merit were awarded: *Mrs. John Inglis*.—A very handsome H.T. Rose of light cerise color and broadly conical shape. The petals are large and stout and the foliage is dark green. It is recommended for all purposes. Raised and shown by Messrs. S. McGredy & Sons.

J. G. Glassford.—This attractive H.T. Rose was admired by many at the Regent's Park show. It is of large size and has broad, stout petals of a bright brick-red color, shaded with crimson towards the base. Raised and shown by Mr. Hugh Dickson.

Coral Cluster.—A very dainty little Polyantha variety which sported from Orleans. It is very free flowering, and the individual flowers, which are perfectly formed, average 1½ inch across. The color is a pale coral-pink. Shown by Mr. R. Murrel—*Gardeners' Chronicle* (British).

FRAGRANCE OF ROSES

Had Shakespeare lived today I question if he would have written those famous words: "What's in a name? That which we call a Rose, by any other name would smell as sweet." I have no desire to deprecate the work of our great hybridisers, for being a raiser myself, I know how hard it is to condemn a novelty because of its lack of fragrance, but I could wish this delightful attribute of the queen of flowers were kept more in view when raisers are making their crosses. I have rarely known it to happen that when two fragrant Roses are crossed that the offspring are scentless. I know it does occur if only one of the parents possess perfume. Now we instinctively expect fragrance in red or crimson Roses, but why should we? Probably it is owing to the fact that most of the old-fashioned red Hybrid Chinese and Galicia Roses were fragrant and from these came the fragrant red Hybrid Perpetuals. Well, then, what is to prevent us using these charming Hybrid Perpetuals as the basework of our crossing? What rich fragrance is found in such old Roses as Louis Van Houtte, Victor Hugo, Charles Lefebvre, and Général Jacqueminot, and yet in such as Duke of Edinburgh the scent is absent. I fancy we could trace the absence of fragrance in some of our bright colored novelties to the influence of this latter Rose.

There are some Roses in which we do not expect to find fragrance, such as white varieties and cream colors; I do not know why we should not. But when we come to reds and crimsons our first act is to search out their perfume. We naturally imagine that if such as General McArthur, Hugh Dickson, Hadley, Lieutenant Chauré, Florence H. Veitch are fragrant, so will all crimsons be; and yet many are scentless, or at the most, have a very faint perfume.

We have much to learn yet as to why one Rose is fragrant and another is not, but I do urge upon raisers to do their utmost to use fragrant Roses in their hybridising, and then, perhaps, the stigma of scentless novelties will vanish.—*The Garden*.

MANURING ROSES IN WINTER.

Manuring *Roses* in the late autumn with a view to affording them protection in time of frost, is a duty which many growers regard with importance, yet, notwithstanding, it is frequently done in an imperfect manner. Of recent years, however, it has been a difficult matter to procure manure, and, consequently, other methods for mulching have had to be resorted to. Time was when manure was "laid on thick" about the roots, and through lack of air, and inevitably warmth, plants succumbed in a hard Winter. If it were possible to glean statistics of recent date we should find that where leaves and straw material have been employed as a Winter dressing *Roses* have not failed to the same extent as under the old method of laying masses of manure on the surface; indeed, I venture to say that they have done better. It is the lighter covering, which does not exclude air, that gives the best results, and in this fallen leaves come to our aid.—*Gardening Illustrated*.

LINNÆA BOREALIS

As he who has visited Switzerland must be able to tell something about the Edelweiss (*Leontopodium alpinum*), Switzerland's most popular plant, so will he who has been in Sweden be able to tell about *Linnaea borealis*. No wild plant in Sweden (it is better to write in Scandinavia) is better known and loved than *Linnaea borealis*, and in our rockeries it certainly ought to get a place. It is wrongly supposed to be difficult to cultivate. A shady, moist place, facing the north, in sandy woodland soil is the most suitable one. With its long, elegant, slender, upright stalks, furnished with small leaves in opposite pairs, which are green all Winter and remain on the plant, it creeps nearly unperceived over the ground. The flowers with which *Linnaea borealis* is adorned continue from June until mid-October. The richest flowering is, however, from mid-June till July. They are campanulate, and the bells no longer than half an inch, while the color is delicate white with pink veins and yellow honey mark inside. They emit a very fine and strong perfume.

But allowing the fact that *Linnaea borealis* is a lovely rock plant, which is wholly worth our admiration, it merits also our special attention by virtue of its name, in which we immediately recognize that of the famous and universally known Swedish botanist, Linnaeus. *Linnaea borealis* is the smallest woody plant known, and it was exactly this humble character which attracted Linnaeus in his youth; and the love of this little plant remained for the whole of his life, because, later on, when Linnaeus was raised to the nobility we see *Linnaea borealis* put in the place of honor in his armorial bearings.

Like the Dutch proverb which says "a lovely child has many names," so also has *Linnaea* been known under many names; for besides that the plant is called by Linnaeus himself as *Linnaea* we find it back in different periods under no less than nine different names, of which *Campanula serpyllifolia* and *Rudbeckia* are the principal. In a day-book of Linnaeus about his great Lapland journey in 1732 we find for the first time the name *Linnaea*; afterwards in several of his works we find the plant under other names until in his book "Species Plantarum, 1753," the plant is kept definitely to the name *Linnaea*.

Besides the scientific name, the plant in Sweden has also many popular names according to the place where it is growing.

The name *borealis* means northern, with reference to the plant growing best and luxuriant in the northern countries. We find it especially in the large forests of Lapland, Varmland and Nedelpad, all Swedish provinces where *Linnaea borealis* grows very freely in the shade on peaty, woodland soil, with preference for soil formed from the fallen needles of the pine trees. The plant is also found in some parts of North Germany, the Alps, and in many parts of Russia.

A special study of *Linnaea borealis* was made some years ago in the Botanic Gardens at Stockholm and a book describing nearly 150 sub-varieties, the result of this study, was written by the late curator of the garden, Prof. Wittrock.—*Irish Gardening*.

ROTATION.

A change of ground is as necessary in the successful cultivation of flowers as in any other branch of gardening. Annuals especially enjoy fresh ground, whilst *Violas* seldom thrive satisfactorily on the same unrenovated site for a long period. Suitability

of position, in regard to height, form, and color often impedes rotation; this may be overcome by lifting the plants, thoroughly trenching the site, and adding new soil before replanting. Soils containing plenty of humus should be well limed, provided subjects which dislike lime are not to be planted. Basic slag is a desirable fertilizer to incorporate with the soil, but, like lime, should not be placed in direct contact with farmyard manure. Tree-roots are often a source of trouble in flower borders; if large trees are in the vicinity, the present is a suitable time to inspect the borders and remove intruding roots.—*The Gardeners' Chronicle* (British).

TOPIARY OR VERDANT SCULPTURE.

THE coming of William and Mary gave the system of cutting and clipping shrubs and trees a new and hitherto unknown value in the eyes of the "curious," which can only be compared to its vogue in ancient Rome where all the swell gardens were full of it, so much so that a gardener became popularly known as a *topiarius*, which, by the way, I always think ought to have been written *torarius*, as otherwise I don't seem to see much point in the name, and wonder why Daubeny in his seventh lecture on "Roman Husbandry" says, "So common did it (cutting trees into regular shapes) become, that gardeners went by the name of *topiarii*, to indicate that this was their especial function." But I am not a philologist and don't understand the quaint vagaries of language. Will some Engleheart tell us why it was that Cicero and Pliny both wrote *topiarius*?

Topiary is a genetic word. The genus includes various species. There is the prim and trim Yew hedge; there are the Box cannon balls and diminutive obelisks; there are—

"... the portal-warding lion-whelp,
And peacock-yewtree of the lonely Hall,
Whose Friday fare was Enoch's ministering."
(Tennyson's "Enoch Arden.")

Yes, and the clipped trees in many a cottage garden—the pride of their owners—the ewe-lambs of their very own bringing up—the joy-perpetual of their tiny plots.

Who can say that the finished work of the modern *topiarius* should never find a place in a modern garden, when a Gertrude Jekyll, the apostle of flower arrangement and beautiful borders, has on her own lawn a verdant sculptured pedestal with a verdant sculptured cat quietly reposing thereon? This summer I saw the broad lawns at Westwick, and certainly they did not lose in either dignity or charm from the introduction of various pieces of the topiarian's art. I may sum up the purport of what has already been written and say, topiary work appeals to sentiment. It is old gardening if you like. Notwithstanding all that its detractors may say, it has a *niche* in our garden economy. Lastly, let not those who live in glass houses throw stones, often they have a nasty, boomerang sort of habit.

But why all this? The splendid large gold-medal group of wonderfully fashioned figures of Yew and Box in Messrs. John Waterer, Son and Crisp's mammoth exhibit, which filled the whole of one end of No. 3 tent at Cardiff, is the immediate cause. The workmanship of the individual pieces was good and I was somewhat surprised when Mr. Waterer told me that they were all home made by a father and son in the firm's employment, who give the whole of their working hours to this art. Usually Box and Yew are the "humble and tensile" plants used, but as in the days of William and Mary, when the pleachers took toll of certain other trees and shrubs, so it was at Cardiff. The famous firm above mentioned had good specimens of work made from both green and golden Yews, from both gold and silver Box, and what is a particular speciality of the firm, from *Ilex crenata*. The numerous standards gave an undoubted lightness to the large group. They were made with green and silver edged Weeping Hollies, *Retinospora pisifera nana*, *Retinospora filifera aurea* and one or two other shrubs. Amid the wealth of old conventional forms and quite up-to-date figures, the stately gothic chair of golden Yew, with its triple pointed back, several corkscrew spirals, the shapely golden bell and the ingenious monoplane and biplane may be singled out as evidences of the wide choice of subjects that a buyer may have for his own in exchange for a greater or lesser number of "Fishers," for I fear, like the real Simon Pures, they are necessarily expensive owing to the time required in their fashioning. Why such figures may not be introduced with circumspection into the modern jumble which we call a garden, I for one fail to see; at any rate, they are not more unnatural than to have Chinese shrubs, North American flowers and South African bulbs in English flower borders; nor than all the unnatural plants called hybrids which are now the commonplaces of modern gardening. It is all a question of degree; and approval or disapproval, a question of taste. It cannot be anything else once the original wildness has been destroyed and man begins to make his own surroundings. But then, have not I recently written urging the retention of the quaint, to some out-of-place-looking, overhanging petal in *Gladiolus primulinus* hybrids, and because I think *Rosa Moyesii* the perfection of a species Rose, am I to look on

Ophelia, Madame Edouard Herriot and General McArthur as plants past praying for; or once again, because I rather regard my own two acres of ground as a casket for jewels, am I to say that others should not have their color schemes or their rock gardens? The gardening world is large enough for us all; take such necessities as Potatoes, even among them we can pick and choose.—*The Garden*.

DEPARTMENT OF BOOK REVIEWS

ROSES: THEIR HISTORY, DEVELOPMENT AND CULTIVATION, by the Reverend Joseph H. Pemberton; large 8vo; xxiv + 334 pages, cloth, with ten plates and 32 other illustrations. Longmans, Green & Co., London and New York. (\$5.)

The book sustains its title well. It is a complete work and a very satisfactory one. Unlike other books on the Rose it is not confined to a treatment of the garden varieties. With systematic thoroughness, after setting forth the botany of the flower it exhaustively describes the many wild Roses with their appeal of graceful beauty that in the wild begets sentiments in the heart of even the most unappreciative observer and which in landscape plantings is, for certain sites, most appropriate. This would well be taken account of by American readers. Why is it that in all the wealth of garden literature produced in this country during the past few years there has appeared only one article, so far as the writer has been able to learn, that of Leonard Barron in *Country Life* for March, 1915, to call attention to this use of the most universally loved of all flowers? The species possess other advantages also, that of requiring practically no pruning and that of involving no constant warring with insect pests and diseases.

Two other classes are given special attention as new and excellent and will be of particular interest to those who have prized the book in its former edition. These are the Perpetual Flowering Musk and the Hybrid Lutea.

The second edition is a great improvement over the first in its treatment of Black Spot, Soils and Manure also. In dealing with these subjects recourse has been had to all the best of modern knowledge available. The various methods of propagation are described in detail and so explicitly that an amateur can find here all that he needs to grow his own plants. The chapter Growing for Exhibition and Exhibiting must make every American rosarian feel that England has much to teach him concerning the fine points of her national flower, much that is here set forth very nicely indeed and with an enthusiasm to be emulated by all members of the other floral societies now so numerous and so popular. The lists of Roses, though they omit many of the best for America, are especially valuable in stating the various purposes for which each variety is best adapted.

THE JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY, vol. xlv, parts 2 and 3 July, 1920, edited by F. J. Chittenden, F. L. S., V. M. H.; 267 + cxxiv pages large 8vo., paper; W. Wesley and Son, 28 Essex St., Strand, London, W. C. (10s. 6d.).

Any publication to which the Royal Horticultural Society gives the stamp of its approval is sure to prove of value. The present volume contains a number of matters that are of general interest to gardeners and horticulturalists of all classes. From the Reverend W. Wilks, but recently released from the office of secretary held from the year 1888, is a plea for support in completing and publishing "The New Pritzel." This, it must be explained, is "an index to all the illustrations of the botanically-identified flowering plants and ferns of the whole world." It aims to contain the correct name and an illustration and description of every plant concerning which the garden-lover or horticultural or botanical student may wish to inquire. That the task of making the work complete and up-to-date is no small task is suggested by the fact that no revision has been made since the original was published fifty-four years ago. The revision involves the making of 300,000 entries and the examination and tabulation of 300,000 plates. The society has already expended \$6,500 for the purpose and needs at least \$20,000 more. Persons subscribing will be given due recognition and receive special presentation copies of the work. Responses to the appeal should be addressed to the Reverend W. Wilks, the Royal Horticultural Society, Office Vincent Square, London, W. C. 1.

In the article Oaks at Aldenham the most notable item is the description of *Quercus pedunculata fastigiata*, the picture of which shows a compact head of the form of the Lombardy poplar. This plant, of manifestly great value in forming landscapes, comes true from the acorns in forty per cent of the cases.

An account of exhaustive experiments in the Partial Sterilization of the Soil records that, while such beneficial treatment of soils is advisable, all chemical methods, though much more convenient and potentially cheaper, leave a persistency of poison deleterious to the crops. Heating, applied directly or in the form of steam, up to 200° F., is the approved method for killing in the

soil the organisms that are harmful to plants and for encouraging the development of bacteria essential to vegetative growth. Under the heading, *Suggestions for the Right Selection of Apple Stocks*, is shown that great progress is being made toward determining, out of the prevailing confusion regarding the selection of dwarfing stocks, those that actually are of the best type. After several other excellent articles come a large number of book reviews and condensed abstracts from "Current Periodical Literature, British and Foreign, affecting Horticulture and Horticultural Science." Then follow the reports of the various committees of the society and a list of new books dealing with horticulture in its various and many phases.

PASTORAL AND AGRICULTURAL BOTANY, by John W. Harshberger, Ph. D.; xiii + 294 pages with 121 illustrations; 8vo., flexible cloth; F. Blakiston's Son & Co., Philadelphia.

This is a very beautifully formed and very scholarly work in which the Professor of Botany in the University of Pennsylvania summarizes succinctly and presents clearly what is known about the injurious and the useful plants of America. The treatment is that which adapts the book to use in the class room. But the arrangement is such that the layman also may readily find out about any plant that is suspected of having caused the poisoning of man or beast or he can trace to its cause, if it lies in the vegetable world, any particular case of poisoning in the garden or on the farm. Better still he may inform himself, quite readily, concerning the plants that are apt to have injurious effects, whether through contact or through being taken into the system. In these processes the reader will be assisted by the many illustrations, all so clear and appropriate. For wider and more detailed study are provided bibliographies, as well as careful suggestions for making practical experiments in the laboratories.

But nearly two-thirds of the book is devoted to plants cultivated in America for yielding food to both man and beast; the edible grasses, the cereals and the legumes are treated, as are the harmful plants in the first part of the book, from the standpoint of botanical study and in a practical manner. Chapters of superior interest and value in this interesting and valuable little book are the last three: Leguminous Root Tubercles, the Accumulation of Nitrogen and Nitrogen-consuming Plants; Weeds and Weed Control; Agricultural Seeds, Selection and Testing.

ELEMENTARY AGRICULTURE, by James S. Grim, Ph. D.; xvi + 502 pages; cloth 8vo; Allen and Bacon, Boston. (\$1.40.)

This is an admirable book, not only for every country boy and girl to study, but for every farmer and farmer's wife to read and even, in these days of renewed movement back to the land, for every city school teacher and pastor and social worker, as well as every suburbanite and, it might even be added, for every gardener, owner of an estate or superintendent of one and for every raiser of livestock. In its adaptation to its primary purpose, that of serving as a text book, it seems to be beyond criticism. The author exhibits upon every page a genuine pedagogic instinct, well trained by experience, coupled with general culture of a high degree. Every chapter and every section is excellently framed to attract reading and really to teach. The unusually many pictures interspersed throughout are well chosen and clear. Each chapter is followed by a set of Practical Questions carefully thought out, by a set of Home Exercises that must be inviting to the intelligent boy or girl living upon a farm, by Suggestions, nicely pointed, for pupil and teacher alike, and by References to Books and Farmers' Bulletins. Of the valuable appendices C alone might be criticised for failing to name and to locate, after the Agricultural Colleges of the United States, the experiment stations, also. Appendix D may possibly not cite all the worthwhile Magazine Articles on Agriculture; but it is a valuable feature of the book. Appendix F is a much needed setting forth of the Use of Farmers' Bulletins which are perhaps not always as teachable as might be desired.

A LESSON ON PLANT PHYSIOLOGY

(Continued from page 403)

Finality, however, is a long way off. There is no certainty which characters in the respective parents of the hybrid will be dominant, whether none of those characters will occupy that position, or whether plants having intermediate characters between the two will result. In the latter case some very valuable results have been obtained in various directions. For instance, the Department of Agriculture has taken the cold resistant trifoliate orange which is a deciduous species, and hybridized it with some kinds of the tender, sweet oranges, which are evergreen. The resulting hybrids of the first generation have generally been semi-deciduous, and intermediate as to hardness, and some of the fruits produced valuable. In these latter cases further reproduction can be carried on by vegetative methods, although according to one of the laws of Mendelism a second generation from seed would probably result in the characters being split up and extreme hardness or sweetness become dominant.

As before mentioned, inuality in plant breeding by hybridization has not been reached. There has not yet been evolved any method whereby the production of hybrids with certain fixed characters will result when carried on by seed. Selection and roguing is always necessary and the method of inheritance of many fundamental characters will probably remain obscure for many years.

In the present day the most important line of work among hybridists and plant-breeders is the production of varieties immune from, or resistant to, disease rather than anything else.

WILLIAM H. LUTTON.

The many horticultural friends of William H. Lutton, founder of the present William H. Lutton Company, will be grieved to learn of his death on Tuesday, November 23, at his home at Ridgewood, N. J., as the result of an automobile accident early in November.

Mr. Lutton was born in Brooklyn, N. Y., forty-four years ago. He received his early training in greenhouse heating under the late Samuel Burns of Thomas W. Weathered & Sons Co., and in 1900 went into the greenhouse business for himself, incorporating in 1914 and serving until recently as President and General Manager.

Mr. Lutton was an indefatigable worker, always on the alert



William H. Lutton

for new ideas and improvements; and because of his sterling qualities, progressiveness and thorough knowledge of his business, enjoyed an enviable reputation as one of the foremost authorities on the construction and heating of greenhouses.

Mr. Lutton is survived by his widow and daughter, his mother, and six brothers and sisters. His many friends will learn with sorrow that during the past twelve months his family has been swept heavily by the tide of misfortune, he being the third to pass away, two daughters having gone before. All who knew him join in extending to his widow and family their deepest sympathy in the loss of so brilliant a member.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

M. C. EBEL, Secretary
286 Fifth Ave.

New York

National Association of Gardeners

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NEW SUSTAINING MEMBERS

Carl Tucker, Mt. Kisco, N. Y.; George F. Tyler, Elkins Park, Pa.; Mrs. Frank B. Keech, Tuxedo Park, N. Y.; John Magee, Mt. Kisco, N. Y. (Henry Prideaux, gardener), have become sustaining members of the association.

NEW MEMBERS.

The following new members have been recently added to our membership list: Archie Campell, Brooklyn, N. Y.; Irving Schofield, West Orange, N. J.; Frederick C. Sorge, Deal Beach, N. J.; Carl F. Eicke, Watson, Ark.; William H. Ward, Astoria, L. I.; George Stewart, Garden City, L. I.

AMONG THE GARDENERS.

Frederick W. Sparks resigned his position as superintendent of the A. B. Dick estate, Lake Forest, Ill., to accept a similar position on the estate of Mrs. Juline Rosenwald, Ravinia, Ill., assuming charge February 1.

Herbert H. Fletcher, gardener to C. F. Dietrich, Millbrook, N. Y. for the last twenty years, resigned his position to accept the position of head gardener on the new estate of L. B. Towl, Newton, Mass.

James Clunas secured the position of head gardener to Mrs. William Grosvenor, Newport, R. I.

William H. Ward accepted the position of superintendent on the estate of Robert Jones, Madalin, N. Y.

Robert McLaren secured the position of superintendent on the H. M. Wallis estate, Racine, Wis., having previously been in charge of the landscape development work.

Gustav Hamelin secured the position of gardener to Mrs. Helen Hartley Jenkins, Norfolk, Conn.

WARNING AGAINST AN UNSCRUPULOUS PRACTICE.

It has come to the attention of the Service Bureau of the association several times recently that men not members of the association, learning that the Service Bureau had the filling of a position, applied, representing that they had been sent by the association. Unless an applicant can present a proper introduction from the secretary, a statement that he has been instructed to apply by the association or its Service Bureau, should not be acceptable.

PROFESSIONAL EXAMINATIONS FOR GARDENERS.

Secretary, National Association of Gardeners:

SINCE reading the report of the St. Louis Convention I had intended to write to you on the above matter in time for the November issue, but other matters supervened.

Upon the surface, the general report, so far as it covered this question as it came before the Convention, cannot be looked upon as being anything but one-sided. A full report of the recommendations against professional examinations was published, but the report of the recommendations in favor of them was limited to the statement that they contained nothing tangible in the way of an operating plan. I have not had the opportunity of reading the recommendations of the Newport branch as it was not published. [The Newport branch recommendations were published in the March issue of the GARDENER'S CHRONICLE.—Editor.] As regards my own, I have always been under the impression that a tangible plan is one that is capable of being carried out. One reason why I consider the plan I set forth tangible is because it was the same in principle as that in use by the United States—not European—Civil Service, for examinations in horticulture in connection with the United States Department of Agriculture; this being, that questions are set upon the principles and practice of gardening for candidates to answer upon paper. Certainly a very simple and easily carried out method in which it is impossible to find anything intangible.

So far as one can gather from the report, it does not appear that the real question was discussed upon its merits at all, as instead of advancing one logical reason against the principle itself, those opposing it contented themselves with bringing forward excuses as to why it could not be carried out. The fundamentals of the practice of gardening are the same all over the world, and the idea is quite a mistaken one that gardening is an entirely different thing in one part of the country from what it is in another. As a matter of fact, a truly professional gardener would be as much at home in Florida as he would be in Maine; he would have no more trouble in being successful along the Pacific coast than he would along the Atlantic. It is true that a man going from North to South, or from East to West, would have to handle some different species of plants, but no one has any right to call himself a professional gardener if he knows nothing more about it than is necessary to grow plants limited to one county in one State. In the South, a man would be able to grow out of doors subjects which perhaps he had only handled under glass in the North; the successful rosarian of the East would find parts of the State of Oregon so ideal for roses that his success there would be obtained with the minimum of trouble. It is only those gardeners whose practice is based upon rule of thumb who would find any difficulty in adapting themselves to a new environment. Further, there is in some States as much difference in climatic conditions within the borders of one State as is covered by several degrees of latitude and a man must have made very poor use of his time if his knowledge of climatology is limited to the climatic conditions of one State or township. To carry the excuse about having different examinations for different parts of the country to its logical conclusion would entail not only different examinations for different States but also for different counties within those States.

Because it was pointed out that the Royal Horticultural Society of England had for some ten years been holding examinations for professional gardeners, a red herring was drawn across the trail by the statement that examinations should be along American lines and not European. It was never suggested that examinations should be confined along European lines. Are the United States Civil Service examinations in horticulture along European

lines? A principle is one thing, and the details of carrying it out another. At all events any worth while gardening that has been done in this country has been by European gardeners.

The excuse that the N. A. G. is not financially capable of carrying out these examinations is equally poor. Had the principle been adopted the initiation of these examinations would be naturally confined to an advertisement to the effect that those wishing to sit for them should send in their names; this would cost a few dollars. Further expense would depend upon the number of names sent in, and would be covered by the nominal fee suggested. If no names were sent in the onus of refusing to consider examinations would be shifted from the N. A. G., upon whose shoulders it now rests, to the rank and file of the gardeners.

The turning down of this question by the St. Louis convention of gardeners will cause outsiders to think that gardeners have no desire to uplift their profession and bring it into line with other professions, the members of which have to undergo examinations before being accepted as members of their professional organization. People will be inclined to think that gardeners cannot stand a professional examination. Many gardeners are complaining that employers do not treat them as professional men but as servants, and yet take no steps themselves to advance their professional standing. The N. A. G. is receiving support and co-operation from estate owners, who have a right to expect that gardeners will at least meet them halfway in their desire to uplift the profession.

ARTHUR SMITH.

It is unfortunate that all those deeply interested in the foregoing subject were not able to attend the convention and take part in the discussion which occupied nearly all of one of the forenoon sessions. There were many arguments advanced in favor of examinations and classifications of gardeners, but space did not permit publishing the discussion verbatim. In the January number of the CHRONICLE we will have Mr. Smith's recommendations on the subject—[ED. NOTE.]

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

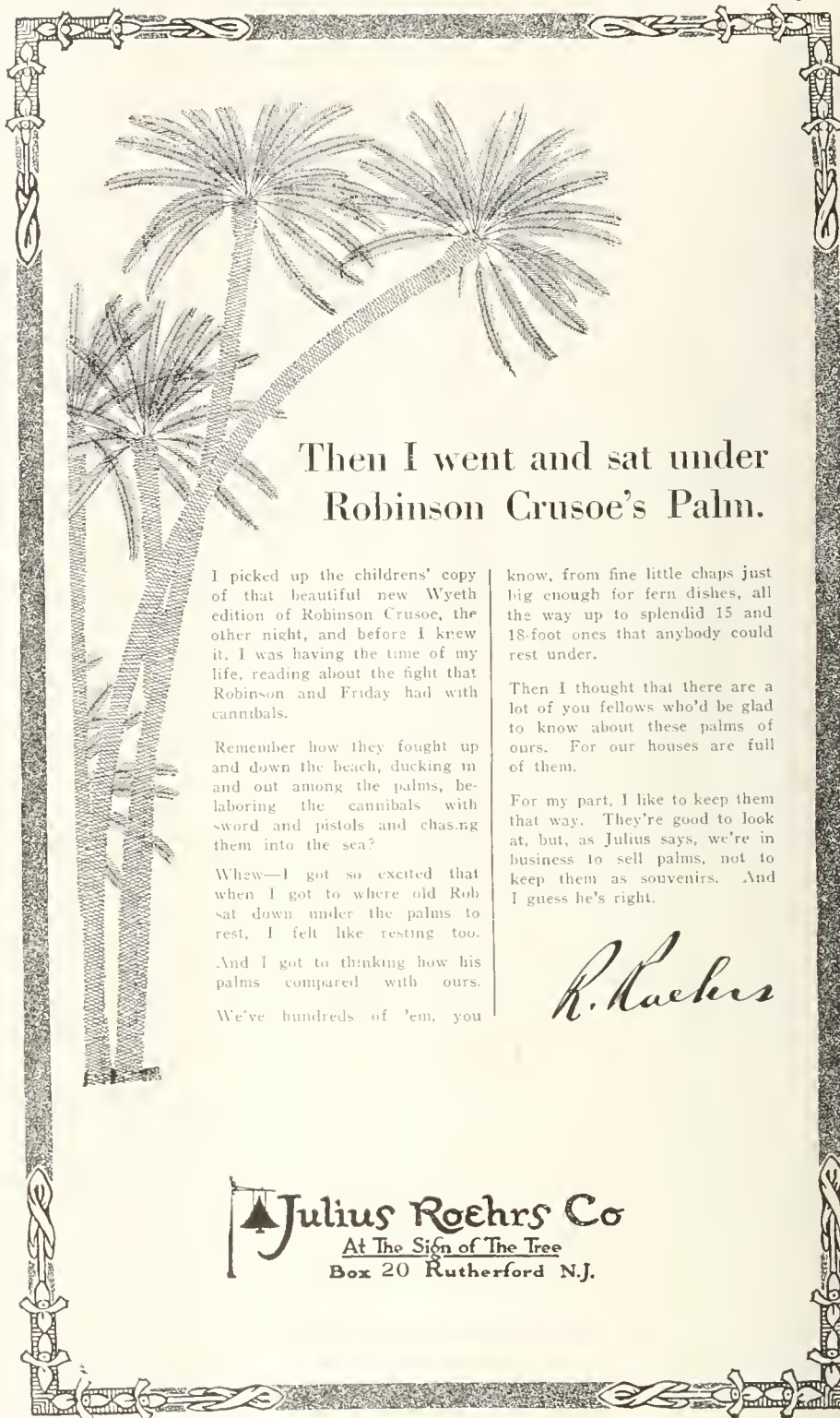
For the first time I have white mold in my root cellar. The tubers being in pretty bad shape. I would be pleased to have you make suggestions as to the best way to fumigate or save my stock of bulbs.—A. E. McK.—R. I.

We would recommend that you take your dahlia roots out of your cellar immediately and set them in a dry, cool place, as the white mold is caused by dampness and lack of ventilation. We do not believe fumigation will aid, although you might burn sulphur.—D. M.

Here and There

PLANTING EVERGREENS.

As far as practicable, the largest subjects should be taken in hand first, and the longer



Then I went and sat under Robinson Crusoe's Palm.

I picked up the childrens' copy of that beautiful new Wyeth edition of Robinson Crusoe, the other night, and before I knew it, I was having the time of my life, reading about the fight that Robinson and Friday had with cannibals.

Remember how they fought up and down the beach, ducking in and out among the palms, belaboring the cannibals with sword and pistols and chasing them into the sea?

Whew—I got so excited that when I got to where old Rob sat down under the palms to rest, I felt like resting too.

And I got to thinking how his palms compared with ours.

We've hundreds of 'em, you

know, from fine little chaps just big enough for fern dishes, all the way up to splendid 15 and 18-foot ones that anybody could rest under.

Then I thought that there are a lot of you fellows who'd be glad to know about these palms of ours. For our houses are full of them.

For my part, I like to keep them that way. They're good to look at, but, as Julius says, we're in business to sell palms, not to keep them as souvenirs. And I guess he's right.

R. Roehrs



Julius Roehrs Co

At The Sign of The Tree
Box 20 Rutherford N.J.

they have remained undisturbed the more care should be taken in moving them. Secure all the roots possible, whether large or small, as the less they are cut about the better; the greater the number of roots that are severed, the greater the shock to the plant or tree. I do not set so high a value on securing a big ball of soil with the roots as some people do, because I have found in practice that to get the ball of earth of a size to be conveniently moved a good many roots must be cut asunder. My experience shows me that it is better to search further for the roots, so as to secure as large a body of them as possible without mutilating them. It is also unwise to move

any shrub or tree when the soil about the roots is dry, and notwithstanding that the rainfall of late has been considerable, it will be found that when large plants have to be dealt with the ground will probably be dry. If such is the case it is very necessary to success that it should be well watered the day before the moving is to take place, and it is equally necessary to well water the roots after the plant is put into its place, and if the weather is dry to syringe the plants in the early afternoon. A mulch of leaf-mould goes a long way toward the re-establishing of the plants that have been moved, in that it helps to retain the moisture.—*Gardening Illustrated.*

LATE ROOT ACTION AND BUD FORMATION.

The importance which gardeners attach to the early Autumn planting of all trees and shrubs is probably due to the fact that root action is continued for a considerable period—varying undoubtedly according to the season and conditions of the soil as to warmth and moisture, particularly the former—after the branches have shed their leaves. To allow this period to pass before the greater part of planting is completed is a great mistake. Many amateurs and others not conversant with the growth and habit of trees and shrubs do not fully realize this, as it is seldom indeed that, having carefully planted a tree, occasion arises to lift the same a few weeks later, and so they remain in ignorance, as it were, as to whether the roots are still active or have become, and will remain, dormant until the following Spring. It is not merely the power of taking hold and becoming established in fresh soil that makes Autumn planting a success, but also in assisting both wood and fruit buds, which are then developing, to store up such matter as will promote clean growth and fertility the coming season.

The subject is of great interest, and should receive careful thought by those who would be successful, especially in fruit culture. What a mistake it proves, that because the trees have yielded their crop, and show signs of the fall of the leaf, further attention is withheld in the way of seeing that the rooting medium at least is kept in a suitably moist condition. Yet this is far from being the case during the Autumn with trees growing against walls, and also with fruit-tree borders under glass. Liquid manure may not be necessary where the trees were well looked after and regularly fed while the crop of fruit was developing,

but what would prove beneficial, especially with trees bearing stone fruits, would be lime-water. The ground may have become manure sick; then all the more reason to treat it with lime. In other directions one's thoughts turn to the value of not only preserving but encouraging prolonged Autumn root action. This, however, is lost sight of by many who dig ruthlessly about their fruit trees at that season, because it is a practice to bury leaves and rubbish and present a neat appearance. How much damage can easily be done, and the prospect of full crops in the future seriously risked by severing all the feeding roots with the spade. Perhaps this proves no worse, however, than lifting the trees carelessly and injuring all the roots, on the preservation of which the future crop largely depends—*Gardening Illustrated*.

PROPAGATING RETINOSPORAS.

Those accustomed to the raising of Conifers from seeds will have noted, particularly in the case of several species of *Cupressus* and *Thuja*, that the juvenile type of foliage is widely different from that of the adult. In the young state the leaves are comparatively long and spreading, whilst in the adult stage some of them are little more than scales. Furthermore, when raised in quantity from seed it will be found that some individuals remain in the juvenile stage much longer than others; indeed, occasionally that character becomes fixed, or nearly so. At one time such juvenile forms were known under the generic name of *Retinospora*.

Of the *Cupressus* the most marked is *C. plumosa*, represented by two or three color varieties, and *C. squarrosa*, with an even more juvenile type of foliage than the preceding. This is still very often met with

as *Retinospora squarrosa*, but its correct name is *Cupressus pisifera squarrosa*.

Under the name of *Retmospora ericoides*, a dwarf, rounded shrub, which acquires a brownish tinge in Winter, is often met with in gardens. It is really a permanent juvenile form of *Thuja orientalis*; a corresponding one of *Thuja occidentalis* being known popularly as *Retinospora dubia*. In propagating these different Conifers from cuttings it will be found that those formed of the shoots clothed with juvenile foliage will strike root much more readily than those taken from the adult portions of the plant. Those in which the infantile leaves are permanently established, such as the few examples referred to above, are among the easiest of all Conifers to strike from cuttings. If shoots from four to five inches long are taken in the Summer or early Autumn and dibbled firmly into well-drained pots of sandy soil, they will, if kept close in a frame or covered with a bell glass, root without difficulty.—*The Gardeners' CHRONICLE*. (English.)

BY AND BY.

All that we have willed, or hoped, or dreamed of good, shall exist,
Not its semblance, but itself; no beauty, nor good, nor power,
Whose voice has gone forth, but each survives for the melodist,
When eternity confirms the conception of the hour.
The high that proved too high, the heroic for earth too hard,
The passion that left the ground to lose itself in the sky,
Are music sent up to God by the lover and the bard;
Enough that he heard it once; we shall hear it by and by.

—Robert Browning.

An English Garden from English Seeds

NOWHERE are more charming gardens than in England. You too, can enjoy the quiet beauty of an old English garden—plant Sutton's seeds this year.

For many years we have been carefully developing flower and vegetable seeds on our own grounds, to a high degree of excellence. This special seed we offer to those who appreciate inherent goodness in seeds.

We publish a "Garden Guide" that contains the offerings that will enable you to plant a truly artistic garden. This will be sent you upon receipt of 35c which will be returned to you with your first \$5.00 order. Send for it today. To you, who are gardeners, if you will send us your name and the name of your employer—the catalogue will be sent free.

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Burpee's New Dahlia Coppersmith

IN THIS new Dahlia we have an ideal variety of strong growth blooming early and continuously until killed by frost. The plants are literally smothered with flowers which are borne above the foliage on stiff, wiry stems. COPPERSMITH is a glorious Autumn color; a pleasing shade of light copper with a suffusion of salmon-yellow. For the past three seasons, COPPERSMITH has been one of the most admired peony-flowered varieties in our fields. Although brilliant in daytime its unique color is intensified under artificial light. Awarded Certificate of Merit at the Dahlia Show of the Pennsylvania Dahlia Society at Ardmore, September, 1920.

STRONG ROOTS, \$2.00 EACH, 3 FOR \$5.00 POSTPAID.

W. Atlee Burpee Co.
Seed Growers Philadelphia

UNDER THE TREES.

Under the trees at noontide
When the summer sun shines hot,
What restful joy and comfort
Abound in this sheltered spot!

The rustle of leafy pennons
And the winsome song of birds
Are balm to hearts awary,
Beyond the power of words.

And dull must be the spirit
Of him who never sees
A glimpse of heaven's own sweetness,
While reesting 'neath the trees.

Blessings on him who planted
These bowers of shade and song,
Where we may rest in comfort
Apart from the busy throng.

—Tree Talk.

BURBANK'S NEW MIRACLES.

Members of the vegetable kingdom will soon be suffering from hopeless amnesia if Luther Burbank goes much further with his experiments in transforming fruits, cereals and plants into things that Nature never intended them to be. According to recent reports, Mr. Burbank will soon introduce to the world a tomato-pepper, an ever-bearing strawberry plant, a new giant dahlia, an ornamental pepper tree and a beardless barley.

Mr. Burbank's gardens of magic in California must be like that wonderland in which Alice had so many amazing adventures. While admitting the practical value of this modern wizard's experiments, one nevertheless feels that some of the results are almost grotesque. If, for instance, the beardless barley could speak, it would probably echo the words of the bewildered old lady in Mother Goose: "Lawd a mercy me! Can this be I?"—*New York Sun*.



FRUIT TREES and FRUIT PLANTS

for Autumn and Spring planting.

Apple, Cherry, Peach, Plum and Pear Trees. Also Grape Vines and Currant Bushes.

Write for varieties and price.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of "Gardeners' Chronicle of America," published monthly at New York, N. Y., for October 1, 1920.

State of New York } ss.
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared M. C. Ebel, who, having been duly sworn according to law, deposes and says that he is the editor of the "Gardeners' Chronicle of America" and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, managing editor, and business manager are: Publisher, The Chronicle Press, Inc., 286 Fifth Ave., New York, N. Y. Editor, M. C. Ebel, 286 Fifth Ave., New York. Managing Editor, M. C. Ebel, 286 Fifth Ave., New York. Business Manager, M. C. Ebel, 286 Fifth Ave., New York.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)

The Chronicle Press, Inc., 286 Fifth Avenue, New York, N. Y. M. C. Ebel, Madison, N. J. M. E. Burniston and J. A. Burniston, both of Summit, N. J. S. Warendorff, 325 5th Ave., N. Y. Chas. H. Totty, Madison, N. J. A. Bauer, Deal, N. J. J. Barnett, Sewickley, Pa.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state). There are no bondholders, mortgagees or other security holders.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the owners, stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other persons, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Sworn to and subscribed before me this 4th day of October, 1920.

[Seal] M. C. EBEL, Editor.
C. I. KELLER.
(My commission expires March 30, 1921.)

SHELL FIRE INCREASES PRODUCTIVITY.

The effect of shell fire on the farm land of Northern France is explained in the report brought back from France by Hugh Fullerton of the Long Island Agricultural Experiment Station, on behalf of the American Committee for Devastated France, of which Miss Anne Morgan is the head.

"The French agriculturists believed that the devastated areas would never again be productive," he said. "I went over two months ago convinced that this was not true, because I had had experience in tearing up



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Paints

SEE how it all whites-off on my fingers when I rub the boards even the least bit. Ned Sanders says: "what little real linseed oil there was in the paint, has all gone, leaving the 'pigments,' " as he calls it, with nothing to hold them together.

Ned showed me in his Happy Happening book, where it told exactly what to do, Dad, in a case like ours. It told how the first coat would have to be different from the second, and explained exactly why.

Now, Dad, don't you go and buy any paint or get any painters here until you have seen that Happy Happening. Ned gave me the address to send 10 cents for it. It is

Long Island soil with dynamite and had found the subsoil fertile. It is an old axiom of agriculture that the subsoil cannot be productive, and the French government, acting on this premise, had condemned large portions of what used to be the most productive areas of France.

"In company with Miss Morgan and representatives of the French government, I visited one of the worst bits of the Aisne war zone. It was called 'Red Monkey Plateau,' which was taken and retaken 18 times. Not a trace of cellar wall remains to tell of its villages, and the soil was overturned to the depth of two to five feet.

"At the foot of the hill the French experts were still maintaining that nothing could grow there. When we reached the top we

found ourselves wading knee deep through the richest red clover I have ever seen. The leaves were as big as silver dollars. Alfalfa covered the deepest holes.

"I will say this for the French: They were prompt to admit their error. Within two days the order condemning this territory was revoked. Four thousand people returned to their old homes in one day.

"It appears that the plowing done by the shells brought to the surface the deep soil which contains valuable materials of which the top soil, used for generations, had been depleted. Riding through France, one can trace the lines of the trenches, now filled in and planted, by the richer, darker green of the wheat growing in the deep-plowed soil."

—The Field.

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Lenox, Mass., Nov. 12, 1920.

(Extract from Letter)

With this I would like to say, I was very much pleased with results from your seeds this past season, and we had a very fine lot of flowers.

S. W. CARLOQUIST.

Newport, R. I., Nov. 2, 1920.

The plants from seed I received from you a month ago came good and strong with healthy root action, and 100 per cent germination. Those I received from another are a sickly lot, and I am dumping them on the compost heap. I appreciate the quality which I received from you in my first order.

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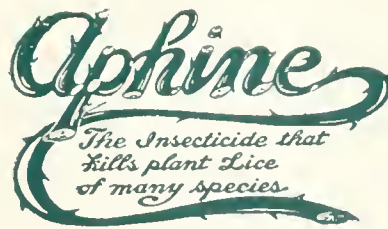


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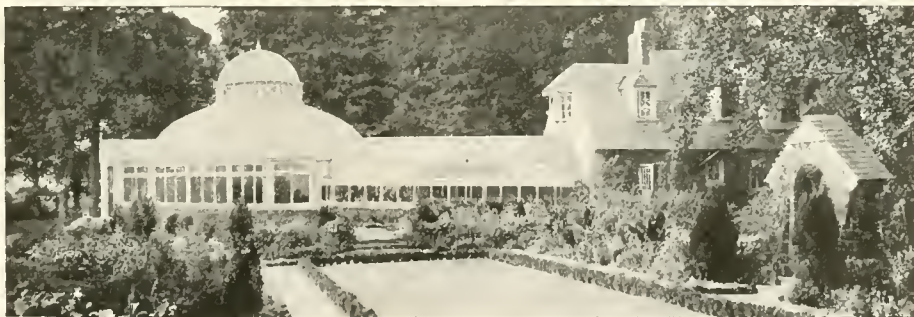
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Things and Thoughts of the Garden

MONTAGUE FREE

IT oftentimes happens when looking over collections such as may be found in botanic gardens, that one becomes acquainted with plants, or groups of plants, whose beauty and usefulness are so pronounced, but yet so unrecognized by cultivators in general, that they are entitled to be called the Cinderellas of the plant world. Belonging in this category is the plant family *Bromeliaceae*. Here is a group that is practically unused by the commercial florists, poorly represented, if at all, in the collections of tropical plants maintained on some private estates, and it is only in botanic gardens that anything like a fair representation of this interesting family can be found. And yet it possesses horticultural possibilities that are practically unbounded.

The beauty of many of the Bromeliads is unquestioned by those who have seen them grown to perfection. The coloring to be found in their flowers, bracts and leaves is unique and incomparable with any other group of plants. The orchids are often cited as being of wonderful coloration, but many Bromeliads are equally worthy of notice in this respect and have a distinct advantage in being attractive even when not in bloom, and are worthy of an honored position in any collection of tropical plants for their foliage alone. They are amongst the easiest plants to grow well, and many of them adapt themselves admirably to dwelling house conditions.

It has been hinted that the coloring both of their inflorescences and leaves is unique. Let us examine, for example, *Billbergia Leopoldii*. Its leaves on the upper side are pale green, with plentiful mottlings of a creamy color. The undersides are red-brown, with perhaps a tinge of purple, and the mottlings are suffused with pink. The effect is remarkable when the plant is grown in a hanging pot or basket and seen suspended against the light. But it is the inflorescence that is most striking and bizarre. The large conspicuous bracts are bright red, dusted with silvery furfuraceous scales, the flowers have petals of green and violet blue, conspicuous golden stamens, and a violet blue stigma curiously marked with spiral ridges. Where in the plant world can we find coloring to compare with this? Another species, *B. nutans*, is similar, but rather more graceful in appearance, with arching leaves and a drooping inflorescence composed of red bracts and flowers with green petals edged with blue.

One, perhaps more commonly seen in cultivation than any other, is *Vriesia carinata*, which has thin, almost membranaceous, leaves of a pleasing pale green color.

The flowers are yellow, arranged in a flat, paddle-shaped spike with bracts of yellowish green changing at the base to various tints of rose pink. Another, belonging in a different genus, which has its flowers arranged in a similar distichous spike, is *Tillandsia lindeniana*. In this beautiful subject the bracts are of carmine and the flowers, which are about two inches in diameter, of bluish violet. As they open out in succession, one or two at a time, the inflorescence remains attractive over a long period. Amongst many others that should be grown for the brilliancy of their flowers are *Pitcairnia Roesei*, with flaming scarlet bracts and flowers, and *Echmea fulgens*, which has a bright red, persistent calyx, tipped with violet blue.

* * * *

Striking leaf coloration is to be found amongst many of this family, but space will not admit the mention of more than a few. The genus *Cryptanthus*, not noteworthy so far as its flowers are concerned, contains several species which exhibit remarkable leaf coloration. *C. zonatus*, for example, has its leaves fantastically barred in a zebra-like effect with buff colored scurfy scales on a ground color of green and brown. The shape and horizontal habit of growth of these leaves is almost lizard-like. *C. beuckeri* is a rather taller grower than the preceding, with leaves of dark green mottled with pale green or white.

A favorite of mine in this family, because it combines grace with its other attributes, is *Guzmania Zahnii*. This deserves to rank with the best of our foliage plants, and yet it is seldom heard of, and still less often seen. Its leaves, instead of being arranged in the rather tight rosette common amongst the members of this family, are long and beautifully recurved. They are semi-transparent, veined with red parallel lines on a groundwork of green which is sometimes suffused with pink or brown, and are entrancingly lovely when seen against the light.

Still more striking, but perhaps less beautiful, is *Vriesia splendens*, which has broad strap-shaped leaves boldly barred with transverse red-brown markings. Most intriguing are the curious markings to be seen on the leaves of *Guzmania musaica*. These take the form of broad, transverse bands made up of irregular pencillings of dark green on a light green ground. On the underside the markings are fainter and of a reddish color.

Queer contrasts are to be seen in the coloring of *Nidularium innocentii*. The leaves towards the base are of a purple color which gradually merges into the green

of the rest of the leaves. (This purple is of a hue similar to that found in the leaves of many of the *Commelinaceæ*, such as *Tradescantia reginæ* and *Rhæo discolor*.) From the center of these rosettes of green and purple arise the bract leaves of bright scarlet which produces an effect that is startling in its uniqueness. To find combinations of color in any way comparable to this one is restricted to the *Bromeliaceæ*.

* * * *

Botanical interest in these plants centers largely in their adaptations to environment. They are mostly natives of tropical America, and many of them are epiphytes. In a large number of species the leaves are arranged in rosettes in such a way that their bases form cup-like reservoirs of water. Considerable quantities may be held in this way, as those who have inadvertently tipped over such plants as *Echinca* can testify. I have measured the amount of water held in the leaf bases of a single rosette of *Echinca pincliana* and found it to be almost one quart.

This water storage apparently has an important function in the economy of the plants. Growing on trees, as many do, the opportunities for absorption of water by the roots is somewhat limited, but this is counterbalanced by the ability of the leaves to catch water and to absorb it by means of thin-walled cells that occur at the base of the leaves. It has also been suggested that the plants obtain some of their nitrogen from insects, and debris of various kinds that fall into the reservoirs, which decay and form food substances that can be absorbed by the thin-walled cells.

The water in the petiole bases frequently has other plants growing in it and Darwin, in his fascinating *Insectivorous Plants*, quotes from Gardner's *Travels in the Interior of Brazil* concerning a species of Bladderwort, *Utricularia nelumbifolia*, which grows exclusively in the leaf bases of certain Bromeliads: "It is only to be found growing in the water which collects in the bottom of the leaves of a large *Tillandsia*, that inhabits abundantly an arid rocky part of the mountain, at an elevation of about 5,000 feet above the level of the sea. Besides the ordinary method by seed, it propagates itself by runners, which it throws out from the base of the flower-stem; this runner is always found directing itself towards the nearest *Tillandsia*, when it inserts its point into the water and gives origin to a new plant, which in its turn sends out another shoot. In this manner I have seen not less than six plants united." Other authorities state Bromeliads and other epiphytes are themselves overgrown by mosses and lichens. Thus we have the Bromeliads growing on trees, although *not* parasitically, be it remarked, and other plants, in turn, on them, which calls to mind the oft quoted lines of Swift:

"So, naturalists observe, a flea
Has smaller fleas that on him prey;
And these have smaller still to bite 'em;
And so proceed *ad infinitum*."

* * * *

The leaf cuticle of the Bromeliads is usually greatly thickened and often covered with scurfy scales which serve to prevent evaporation and thus tide the plants over hot dry periods. That it is effective I have seen proven by rosettes of *Cryptanthus*, which have been broken off, or fallen off, the parent plant and thrown under the bench. Here, without roots, they kept in good condition for a considerable time, although there were steam pipes just above them and such watering as they received was spasmodic and accidental.

Some of the Bromeliads may be considered as true

xerophytic plants, and as such can perhaps best be cared for in the Cactus house rather than in one where more humid conditions prevail. Examples of plants in this group are *Dyckia* of various species, *Bromelia lasiantha*, and *Hechtia argentea*. The latter is a striking object, forming rosettes which may be a foot or more in diameter, formed of very stiff, spiny and recurved leaves which are silvery and shining. In this group belongs *Puya chilensis*, one of the hardiest of the family, which can be grown outdoors with Winter protection in favored sections in England.

The xerophytic nature of many of the Bromeliads may account in a large measure for the tolerance they exhibit when grown in the arid air of the ordinary dwelling house.

It is amongst these xerophytic types that we find protective spines most highly developed. In some species it almost seems that they are designed as revengeful weapons as well as a means of defense. Thus in *Ananas macrodontes*, for example, the stout formidable spines at the tips of the leaves point outwards whilst those at the base point inwards. Therefore, it would appear that should any browsing animal have the temerity to attempt to make a meal from this particular species, he would be warned by the out-pointing spines and chastised on his retreat by the in-pointing ones. *Bromelia pinguin*, a species that attains a height of about four feet, has similar vicious proclivities and is said to be used as a hedge in the West Indies. After seeing it one can imagine that such a hedge would be impenetrable. In many species the spines form a distinct decorative feature, especially when they are colored, as in *Echinca pincliana*, which has prominent brown spines.

* * * *

The only plant of prime economic importance in this family is the pineapple, *Ananas sativus*. Many gardeners, especially those with English training, whose experience extends back a period of years, will remember when this delicious fruit was an important product under glass on many private estates in northern climes. But with the advent of improved methods of transportation, the pine "pit" has lost its importance and we rely instead on fruit shipped from some center where it is grown in the open, or on the canned product. To many the latter is preferable, as the fresh fruit that we receive in northern markets is shipped before it is properly ripe and is none too palatable. It is worth while to grow a few pineapples in pots, if only for the purpose of surprising casual visitors, many of whom have a vague notion that "pineapples grow on trees somewhere in the South." There are two variegated varieties of the pineapple that are worth growing for their foliage, and these, if given reasonably good treatment, will often reward the grower with a fruit. The best form, I think, is *Ananas sativus* var. *variegatus*, in which the center of the leaf is green and the margins of cream or yellow. In *A. sativus* var. *porteanus*, this coloring is reversed with the yellow in the center. In addition the leaves are sometimes striped or suffused with red.

The other species in this family that enters into commerce for reasons unconnected with its ornamental appearance is *Tillandsia usneoides*, the well-known Spanish Moss, which is used for stuffing mattresses. This is a true "air plant" and beds trees and telegraph wires in parts of the south. In general appearance it is strangely similar to the lichen *Usnea*, which is to be seen hanging from the branches of the firs and spruces in the north. The Spanish Moss lives under greenhouse conditions, provided a warm humid atmosphere is maintained, even when suspended on nothing more nutritious than copper wire.

Making a Rose Garden

ROSARUM AMATOR

THE Location—The location of a Rose garden is of utmost importance. This garden should not be shaded either by buildings or trees or shrubs to any appreciable extent; it should receive the unbroken light, and free air. It should be far enough away from trees and shrubs so that their roots cannot penetrate its soil. A Southeastern exposure is, all things being taken into consideration, the most favorable; next best a Southern, and third a Southwestern, a building or wall or hedge or trees on the North side or indeed on every side but not so near as to rob the garden of sunlight and free air, yet near enough to break partly the force of the heavy winds, is beneficial.

This is the ideal location, where the very highest results may be expected, but the Rose lover may be assured that good results may be looked for in Rose growing where buildings or trees, not very close to the garden, shade it, but not very heavily, some part of the day.

Soil—Any soil which will produce a good crop of garden vegetables, will, when properly prepared and sufficiently fertilized, be suitable for successful Rose growing. A clay loam, not over stiff, and well drained is the best. A light sandy loam is benefitted greatly by removing a portion of it and substituting a rich clay, and a heavy clay soil by a partial substitution of sandy loam or sand.

Fertilizers—Thoroughly decomposed cow manure, a year or more old is best for Rose growing, as it can be used very freely without burning the roots, and helps retain moisture in the soil. Sheep, hen or hog manure, well rotted and pulverized, or at least well broken into small pieces may be used where cow manure cannot be obtained. If animal manures are unobtainable, the best substitution is pure ground bone in several degrees of fineness.

Preparing the Beds—Rose beds should be only so wide that a gardener can give the bushes all necessary care without stepping on the beds. In preparing these throw out the soil to the depth of one and one-half feet. If the lower soil, or indeed all of the soil, is very poor, cart it off and substitute good soil for it. If the ground is rather low, and the water settles away slowly after a rain, excavate a foot deeper than before mentioned, and at the bottom of the excavation place a layer of broken bricks or stone, and above this a second, and a third layer, each of pieces of brick or stone of smaller size than the former, and so placed as to fill the interstices of the former layer. Finish with a top layer of gravel and coarse sand. The object, which should be kept in mind, of this arrangement of brick or stone and gravel, is to so lay them that the soil when returned to the excavation will not work downward through the gravel and stone, and clog the drainage.

In returning the good soil to the bed, it should be mixed with the animal manures previously mentioned in the proportions by bulk of four parts soil to one part manure, and both soil and manure should be well pulverized.

A spread of pure bone flour, in addition to animal manures, sufficient to whiten the surface of the soil, applied after the bed is prepared, and raked into the soil lightly, will be beneficial.

If it is necessary to rely entirely upon bone fertilizer, mix pure cracked bone in the proportion of about one part to sixteen of soil when making the bed, and after the bed is made apply to its surface a spread of equal

parts of pure bone meal and bone flour, thick enough to entirely cover the soil, and fork or rake it in thoroughly. The Rose bushes will soon feel the effect of the bone flour, and later of the bone meal and cracked bone.

The soil of the bed or border, when finished, should be about four inches higher than the surrounding surface; it will soon settle.

If a Rose bed is prepared a few weeks before the Rose bushes are set, the result will be more satisfactory.

Upon the quality of the soil, the fertilizers, and the thorough mixing and pulverizing of these when the beds are prepared, much of the success in Rose growing depends.

Setting Out the Bushes—Hybrid Tea and Tea Roses should be planted eighteen inches, and Hybrid Perpetuals two feet apart.

Many Roses are grafted or budded on wild Rose stock, at a little distance above the roots. In setting out such Roses the point where the graft was made should be about two inches below the soil, when the bush is set out. Before setting the bush, cut off all injured roots with a sharp knife just back of the injury. Place the bush in the hole prepared for it; spread out the roots carefully on all sides; cover them with sufficient soil to nearly refill the hole, pressing it down very firmly, but leaving the upper soil loose.

After setting, prune with a sharp knife, the very slender, weak shoots back to the body of the bush, or large branch, out of which they are growing. Prune the stronger shoots back so that there will be only one eye (branch bud) and the strongest shoots so that there will be only two or three eyes between the point where the cut is made and the body or branch out of which the shoots grow.

The Blooming Habits of the Several Classes—Tea, Hybrid-Tea, Dwarf Polyantha (often called Baby Rambler), roses under favorable conditions bloom from Spring to Autumn. Hybrid-Perpetuals produce their main crop of blooms in June and some, not all, varieties under good culture give some casual blooms the remainder of the season, especially in the Autumn. Ramblers, Trailers, and Climbers, except Hybrid-Tea and Tea Climbers with very few exceptions, bloom only once during the year.

Summer Pruning—Hybrid-Perpetuals, in order that they may give some casual blooms after the June crop, and the Teas, Hybrid-Teas, and Dwarf Polyanthas should be severely Summer pruned for best results. This pruning in a large measure is performed in the proper cutting of the blooms.

Cutting blooms and pruning at the same time is done in this way: when we pick a bloom, or in case of Polyantha roses a flower stalk of blooms, we should sever the stem or stalk with a sharp knife taking with the bloom or cluster of blooms a stem of such a length as to leave only one or two full size, vigorous leaves between the point where the cut is made and the body of main branch out of which the flower branch grew. Out of the axils of these leaves new branches will spring; allow only one or two of the strongest to grow, and cut away the weaker. These stronger branches will probably produce other flowers, for it is on the new wood of roses that the flowers grow. This method of picking will give sometimes long and sometimes short stems, but should be strictly followed, and a branch bearing a rose should never be broken off clear back to the body or main branch merely to secure a long stem, but should be cut exactly as directed above, be the stem long or short.

As for further pruning any small weak shoot, which has unobserved got a start, should be cut entirely away, as it only takes the strength which should go into the vigorous branches, and will itself either produce no flower or an insignificant bloom. Sometimes even vigorous shoots from leaf axils, mentioned above, or from latent buds on the main body or branches or root fail to produce flower buds; such shoots are spoken of as blind wood, and should be cut back so as to leave only two or three full sized leaves between the point where the cut is made and the body or branch from which it sprang, the number of leaves left on either a blind shoot or flowering branch before mentioned always depending on the vigor of the shoot. This manner of cutting blooms, and this cutting out of weak shoots and cutting back of blind shoots make low-growing robust bushes, which produce flowers of largest size and highest quality.

Frequent culture and fertilizing also are important factors in the Summer care of roses. The soil not only closely around the rose bushes but over the entire surface of the bed or border should be stirred once or twice each week to the depth of about one inch and made as nearly fine as dust as possible. This frequent culture and dust-like surface soil will conserve the moisture and leave little necessity of watering.

Once a month from April to September inclusive there should be worked into the surface of the soil all over the rose bed or border and around specimen bushes on lawns, a generous application of pulverized sheep manure or well decayed cow manure, and half way between these applications a spread of pure bone flour (often called by the seedsmen "Rose bone flour") sufficient to make the surface white.

Well pruned, thoroughly cultivated and generously fertilized rose bushes are far less liable to the attacks of disease and insects than neglected bushes.

The prevalent diseases are mildew, which appears as a whitish powder on the foliage and causes it to curl and blister, the remedy for which is flowers of sulphur applied dry, preferably with a powder bellows or gun, or fungine, and "black spot," which appears as black spots on the foliage, a very dangerous disease which, if taken at its first appearance, spraying with Bordeaux mixture or fungine will help somewhat.

The most common insects which attack rose bushes are aphids, thrips and several kinds of small worms, and rose bugs. The remedy for the first three is any one of the nicotine preparations.

For the rose bugs, hand picking has always been the main dependence, but now "Readeana Rose Bug Exterminator" is much used and pronounced very effective, and there has been recently placed on sale a new Rose bug killer named Melrosine which is well spoken of.

Preparing the Bushes for Winter—Pruning and fertilizing should be suspended by Oct. 1st, and when in November the ground freezes an inch or two deep at night, the rose bushes should be put into Winter quarters by simply heaping up the soil a foot high or more around each, a protection which is both safer, as it does not harbor mice, which often girdle the bushes by eating off the bark, and more effective than manure or leaves. This soil is easily thrown up around the bushes, when they are planted in rows, and even when they are in beds, it may be brought in a wheelbarrow from another part of the garden for banking the center bushes of the beds while the soil around the bed can be thrown up against the outer rows of bushes. This soil should be drawn away from the bushes in early Spring as soon as the buds on the tops of the bushes begin to swell, and all dead and weak wood be cut out and the other branches cut back so as to leave only one to three eyes (leaf buds) between

where the cut is made, and the body or branch out of which it grows.

The following lists of roses comprise some, but not all of the best varieties.

Tea Scented and Hybrid-Tea Varieties.—These are grown for cut flowers, and bedding plants combined. They bloom from Spring till late Autumn more or less continuously, some more freely in Spring, others in Summer and others in Autumn. Under good culture they are very satisfactory.

Red and Crimson Colors

Chateau De Clos Vougeot.	Hadley.
Etoile De France, Crimson.	Hoosier Beauty.
General McArthur.	George Dickson.
Edward Mawley.	Red Radiance.

Yellow Shades

Marquis De Sinety.	Mrs. A. R. Waddell.
Mrs. Aaron Ward.	Harry Kirk.
Rayon D'Or.	Lady Hillingdon.
Duchess of Wellington.	Lilian Moore.

Mad. Ravary.

White

Kaiserin Augusta Victoria.	White Maman Cochet.
Pharisaer.	Florence Pemberton.
Double White Killarney.	Molly Sharman Crawford.

Different Shades of Pink

Belle Siebrecht, deep pink.	La France, bright pink.
Jonkeer, J. L. Mock, Carmine-rose or "Imperial pink."	Laurent Carle, velvety carmine.
Mad. Caroline Testout, salmon-pink.	Los Angeles, flame pink.
Marquise De Canay, silvery-rose.	Mary, Countess of Ilchester, crimson-carmine.
Prince De Bulgarie, flesh-rose.	Mrs. Charles Russell, rosy carmine.
Radiance, pink.	Premier, dark pink.
Lady Ashtown, soft pink.	Vicountess Folkestone, salmon-pink.
Dean Hole, Carmine-pink.	Ophelia, salmon-pink-flesh.
Columbia, pink.	

Hybrid Perpetual Roses

These give a heavy crop of splendid flowers in June, and some varieties under excellent culture give a limited number of flowers in late Summer or Autumn.

Different Shades of Pink

Baroness Rothschild, light pink.	Mrs. John Laing, soft pink.
George Arends, soft light pink.	Mrs. R. G. Sharman Crawford, rosy pink.
Mad. Gabriel Luizet, silvery-pink.	Magna Charta, rosy pinkish carmine.
	Paul Neyron, clear pink.

Red and Crimson

Ulrich Brunner, cherry-red.	Prince Camille de Rohan, crimson-maroon.
Marshall P. Wilder, crimson.	J. B. Clark, deep scarlet.

White

Frau Karl Druschki.	Mad. Plantier.
Margaret Dickson.	

Dwarf Polyantha Varieties

These are used for massing in beds or for edging beds of tall growing roses. Their blooms, which are borne in sprays, may be used for cut flowers.

Aennchen Muller, deep rose.	Jessie, crimson.
Baby Rambler, red.	Baby Dorothy, bright pink.
Baby Tausendschon, pink.	Perle D'Or, yellow.
Cecile Brunner, bright rose.	Mrs. Wm. Konig, white.

Climbing Roses

Tausendschon, pink.	Crimson Rambler, red or crimson.
Dorothy Perkins, pink.	Philadelphia, red or crimson.
White Dorothy Perkins, white.	Dr. W. Van Fleet, flesh-pink.
Excelsa, red or crimson.	Silver Moon, white.

Cultural Notes on *Calceolaria Stewartii* and Its Varieties

GEORGE F. STEWART

AS I have been asked by many of my fellow gardeners to furnish the cultural directions for *Calceolaria Stewartii* and its varieties, I have decided that the best means of disseminating them is through the GARDENERS' CRONICLE.

These plants are now starting into active growth and their shoots need to be stopped back. It is preferable to perform this operation about a week previous to potting, for after they are potted, they start with a more evenly balanced break all over the plants. The soft shoots that are pinched off are used for cuttings and inserted in clean sand in a temperature around 50° to 55°.

The cuttings should be watered every day for about ten days, not a mere spray overhead, but a thorough drenching with clean water. I may here state that I have practised the drenching method every day with nearly all kinds of cuttings, except geraniums and other similar woody plants, and have found that it is not only a quick means of rooting cuttings, but also the best preventative for the so-called damping off that we hear so much about among gardeners. This practice covers an experience of over thirty years.

The *Calceolaria* will be rooted in about two weeks if one obtains good soft tops. Pot them in two inch pots in nice, light, sandy soil, shifting them right along as they require it. The compost for potting is one part loam, leaf mold, preferably oak leaves one year old, fern root such as is used for potting orchids, sand and decayed horse manure. These are used in equal proportions with some broken charcoal. To about one pailful of the compost a small handful of Clay's Fertilizer is added. After the plants are well rooted in their flowering pots, water with manure water, about a good handful to an ordinary watering pot. I apply cow manure, horse manure and hen manure and when watering with a fertilizer use a handful to the same amount of water.

The plants can be manipulated so that they will flower early or late. I have had them in flower as early as the first week in April, and as late as July, and I have no doubt, near the salt water, along the coast of Maine, one could have them in flower in August. Gauging the time of flowering is done by pinching and potting. Near Boston, about seven weeks are allowed from the time they are cut back until they flower, always potting a few days after they have been cut back.

A little care has to be exercised to carry stock plants in

good condition after they flower, until Fall. This is done by placing the plants in partial shade in a cool north house or outdoors under a tree, and using care in watering. Water is given only when they show signs of wilting. Along about the end of September, I look over our plants which have flowered in from six to eight inch pots and select the best for large specimens for the following year. These may with good care, as described above, be flowered in twelve inch pots with a spread, when staked out, of from four to five feet in diameter. I grow the plants in a night temperature of about 45°. If they are desired to flower early, from 50° to 55°, allowing a rise of ten degrees with the sun.

The plants are subject to attacks from green and white fly. Fumigating once a month with Hydrocyanic gas at the rate of one-quarter ounce to the thousand cubic feet of space our house is not troubled with them. To those who have never used this gas, I will add, that there is a

little booklet sent out by the Roessler & Hasslacher Chemical Co., 100 William St., New York city, giving full information how to apply. They also supply Sodium Cyanide in one ounce egg form, which I have found to be the handiest form for greenhouse fumigation.

There remains to us a great duty of defense and preservation; and there is open to us also a noble pursuit, to which the spirit of the times strongly invites us. Let us advance the arts of peace and the works of

peace. Let us develop the resources of our land, call forth its powers, build up its institutions, promote all its great interests, and see whether we, also, in our day and generation, may not perform something worthy to be remembered.—Daniel Webster.

Today is yours and mine; the only day we have; the day in which we play our part. What our part may signify in the great whole we may not understand, but we are here to play it, and now is our time. This we know: it is a part of action, not of whining. It is a part of love, not cynicism. It is for us to express love in terms of human helpfulness.—David Starr Jordan.



A specimen plant of *Calceolaria Stewartii*—Var. *Lymanii*

NEW YORK SPRING FLOWER SHOW
Grand Central Palace New York City
MARCH 14 to 20, 1921

The Power of Movement in Plants

WILLARD N. CLUTE

THE power of motion seems to be inherent in all protoplasm. So common is motion in animals that we mentally associate motion with life and often regard the less active plants as scarcely alive. Among the unobservant the ability to move is relied upon to distinguish animals from plants, but plants are able to move as readily as animals when the necessity to do so arises. Their movements are less noticeable than those of animals because they are not obliged to move about in search of food as the latter are. As regards the ability to move about in the cells, the protoplasm of plants is rather more active than that of animals. In numerous plant cells the protoplasm is not stationary, but is constantly revolving or streaming from one part of the cell to another.

A considerable number of one-celled plants, such as bacteria and the simple algæ, move through the water by lashing it with tiny threads or cilia and in some cases are scarcely to be distinguished from the one-celled animals. In other algæ organized into chains of cells, there is frequently a movement of the entire filament. This is very noticeable in *Oscillatoria* a common blue-green alga of stagnant pools. Most striking of all forms of plant locomotion are those movements of certain extremely simple plants known as slime-molds. These may often be found in Spring and early Summer on rotting logs, stumps, and bits of bark, as soft slimy masses of naked protoplasm, white, red, or orange in color. The entire mass of protoplasm, which is frequently as large as or larger than the hand, moves over the substratum with a streaming motion not unlike the way in which spilled molasses spreads. It is little wonder that the slime-molds were once regarded as animals.

A large number of plant movements are connected with growth processes, ranging from the adjustment of the leaves to light to the coiling movements by means of which climbing plants are able to cling to their supports. Included in this class of movements are all forms of nutation or nodding so common in young plants. In such cases the tip of the stem bends toward the earth and straightens up, joint by joint, as the stem lengthens. Climbing plants appear to get up by an exaggerated form of nutation. If such plants are grown at a distance from a support, the tip will bend over and then begin revolving in an ever widening circle until a support is reached. Should a support be out of reach the stem drops to the ground after a time and the tip once more becomes erect and begins a new set of circles. In the case of tendrils which must often quickly grasp a support, the coiling motion is quite rapid enough to be easily seen. It is often as rapid as the second hand of a watch. The sunflowers are celebrated in prose and poetry for turning their flowers and leaves to the sun all day, but this is an error. They derive their names from the flower-head which resembles the conventional picture of the sun, and aside from facing the best light do not generally move more. There are some plants, however, which do follow the sun through the heavens and these are commonly known as heliotropes. It is likely that not all the plants named heliotrope have the habit, however.

No adequate explanation has ever been given of the movements involved in the so-called "sleep" of plants. It was once thought that such movements were adjustments made to prevent the radiation of heat at night, but this seems to be negated by the fact that plants with "sleep" movements are common in the warm tropics

where no heat conservation is necessary. Whatever the cause, the phenomenon is fairly common and may easily be observed in the leaves of *oxalis*, clover, bean, locust and many others. The habit is found in the seed-leaves or cotyledons of many plants which do not exhibit the habit when mature. Strangely enough the sleep habit is not confined to flowering plants but is found among the fernworts. The marsilias or water-clovers close their leaflets in the same way at the approach of evening.

The numerous compass plants have the habit of turning their leaves in such a way that they face roughly East and West with their edges toward the sky and earth. The prickly lettuce, a common garden weed is well known for this habit. In all probability it is the increasing heat that stimulates the compass plants to turn the edges of their leaves to the sun. In torrid regions a number of plants habitually carry their leaves in this position. Other movements of leaves due to heat are in the nature of passive changes due to loss of water, rather than to any action of the protoplasm. Of this nature are the rolling of corn leaves, and the flagging of numerous other plants under a hot sun.

The classic example of a plant with motile leaves is the well-known sensitive plant of old gardens and conservatories. In this plant the leaves droop at a touch, the leaflets folding rapidly together and the whole leaf lowering toward the earth. Heat and other stimuli will cause the plant to go through its motions and it is interesting to know that the plant can be put to "sleep" by the use of chloroform. Among common sensitive plants are the partridge-pea of sandy waysides and the *Schrankia* or sensitive rose.

Numerous other plant movements are connected with the phenomena of flowering. In this category are included the opening and closing of flowers, sensitive stamens and stigmas, various positions assumed by the essential organs as flowering progresses, the nodding of flowers to avoid the rain or to facilitate pollination, and the changes in position that occur after the flowers have faded. The movements concerned with seed dispersal are for the most part not movements of living matter. In a majority of cases, dryness sets the trap and pulls the trigger. As the fruits dry a tension is set up in certain tissues which finally ruptures the seed vessel and scatters the seeds.

It is well known that certain insectivorous plants prey upon animals, catching and devouring even such active forms as flies and beetles. In some cases no motion on the part of the plant is necessary, the traps being so arranged that the insects trap themselves. In the sundews, butterworts, and Venus' flytrap, however, the plants take an active part in their capture. It is true that the sundew and butterwort first entangle their prey in a sticky secretion, but then the leaves roll up to form an impromptu stomach in which the insects are digested. The Venus fly trap, however, scorns decoys of any kind and with a contrivance not unlike a steel trap on the tips of the leaves manages to grasp its agile prey.

There are at the present day but too many who imagine they have perfectly done their duty, because they are kind toward their friends, affectionate in their families, inoffensive toward the rest of the world.—*Mazzini*.

The Dahlia and Its Future

By RICHARD VINCENT, Jr., President American Dahlia Society

THE past history of the Dahlia up to a few years ago has been published many times, so that while it is interesting as any other flower that is grown, it is hardly necessary to repeat it again in these columns. What interests us most at the present time is the tremendous change that has taken place within the past decade, in the wonderful size, coloring and texture of a number of varieties produced.

There is a little lack of good commercial and all round varieties but these will come along, as several real good ones were shown at the last New York show, and more will be produced as the requirements call for them. The majority of new Dahlias are adapted to the amateur more so than to the commercial grower. That the Dahlia is growing in popularity is plainly evident, as the Dahlia shows everywhere indicate, and should the interest this season increase as it has done the past few years, there is no doubt but that there will be such an exhibition of blooms at the various Dahlia shows that it will surprise even the most enthusiastic growers. The indications are that the New York show the coming year will be the largest and best the world has ever seen, additional space has already been engaged and many entries made. One thing that will and does help the Dahlia cause, is its easiness of cultivation, its adaptability to various situations, the many uses its flowers can be put to both by the florist and the private gardener, as the more the Dahlia blooms are cut the better ones there will be. The time has arrived when any garden not having a few Dahlias to cut in the Autumn misses a big opportunity for a display just at a time when they are most needed, as it is the Dahlia that fills the gap between the Summer flowers and the Chrysanthemum, and we all know that a bunch of beautiful Dahlias are acceptable anywhere and at all times.

New types are constantly being brought forward, so much so, that a set of rules made by the nomenclature committee a few years ago has now to be changed, and so it will continue for time to come, as new seedlings are continually introduced at every exhibition, some entirely different from previous ones, which make it puzzling to the judges, and often a disappointment to the exhibitor, as there are almost sure to be some among those exhibited that, according to the present ruling, are apt to be disqualified by the judges, simply because they show

some other type different to what the class calls for. The nomenclature committee of the American Dahlia Society will attend a meeting in New York during the month of January to take into consideration the classification of newer types and hybrids and to formulate new rules for the judges of this year's shows to judge by; there will also be a set of rules adopted that will meet all cases wherever possible, so that no one will be debarred because his or her type does not conform to a certain form of classification.

When we realize the few limitations that the Dahlia grower has in either soil or climatic conditions and that it will grow better with less work and also yield more blooms for the work done than any other flower, we realize how hard it would be

to forecast what wonderful achievements the Dahlia specialist will have accomplished at the end of the next ten years. It would seem like a wild prophecy to predict results as there will be almost a countless host of people growing the Dahlia when its easy cultivation and the charm and beauty it adds to the home garden during the Fall blooming season becomes better known. Let the American Dahlia Society's motto be "Education and Onward for Dahlia Beauty," whether in the palace garden or the cottage home.

In the March number of the GARDENERS' CHRONICLE there will appear an article on the cultivation of the Dahlia, the uses it can be put to, a description of the novelties and newer varieties and special notes by some of our Dahlia enthusiasts.



Dahlia Patrick O'Mara, Introduced by Richard Vincent, Jr.

OUR COVER ILLUSTRATION

THE illustration on our front cover, reproduced from a photograph through courtesy of John Scheepers, Inc., shows a group of the famous "Mareau" Dahlias in the private gardens of Judge Josiah T. Mareau, Green's Farms, Conn. The varieties shown are, from left to right: Theodora Bickley, Mrs. I. de Ver Warner, Cleopatra, Venus.

The Judge does not plant his wonderful Dahlia creations in rows; he uses them for decorative effect in his ornamental gardens, together with the full range of other fine flowers, and he succeeds admirably with them.

During the flowering season, many of the Eastern Garden Clubs and Horticultural Societies visited the Judge's private gardens, which are open to the public, everybody leaving full of enthusiasm about the wonders they had seen.

January Birds

PAUL B. RIIS

JANUARIUS, the child, symbolizes the birth and dawn of the new year. But, this child possesses the grip of the mature man and the force of a giant. No feeble, groping efforts, nor indecision mark its steps, nor does sympathy disrupt its energy. Relentlessly it rules with an iron hand, sweeping the dormant fields with fury, and disdaining to temporize its force. Life is at a low ebb. The birds are more nearly stationary now than any other time of the year. Yet, one may take a ramble out of doors through the frozen fields and meadows, the silent woodlands, and wrest from the bleak landscape delightful hours.

We select a charming valley of woodlands and meadows, where once a cardinal and evening grosbeak, and a little later a flock of purple finches, rewarded our efforts. Here the Sumach bobs, the Nanny berry, wild grape, bittersweet, acorns and wild hemp grew abundantly: a paradise for feathered friends.

The opalescent sky contrasts strangely with the white mantle of Mother Earth and the sting of the North wind challenges our mettle. The silvery covering of snow faultlessly stretching away in the distance, truthfully records the coming and going of our wild life.

Empty hangs the seed-pod of the milkweed and the dried florets of heath aster and wild sunflower blow violently in the wind. Here in a patch of waving ragweeds, we examine the delicate tracks of tiny feet of field mice. The tracks become variable and countless as of great numbers and on a nearby willow, we spy their eternal Nemesis, the northern shrike. The few juncos flitting away through the underbrush seem oblivious to the danger above them, and continue their ranging unharmed.

Purposely we follow the winding course of the creek closely. Its barely audible murmuring beneath the ice grows in volume as it regains an opening where its rapid descent hinders the formation of icy prison walls. The silvery ripples are rendered musical for joy of its momentary freedom.

The noisy remonstrance by a red-headed woodpecker at our intrusion into its sanctuary arrests our attention and we note with interest that the black and white of the immature bird is undergoing a change; its crown distinctly tinged by the dawn of fiery red. Dumbfounded by a familiar rattle, inseparable from open water and seasons and yet sure of our grounds, we single out its author, a belted king-fisher. Its familiar form and antics belie the severity of the season, and yet its measure of prosperity is running over. The minnows basking in the open stretches, furnish an easy living for the delinquent migrant. A little further up the stream, we note the entrance to its nest in an overhanging gravelly clay bank, now serving as a shelter for the Winter, and close by a second one partly caved in, revealing the chamber within littered with bones and refuse.

The grasses and what were but a short time since, beautiful flowers, now brown and dead, are nodding in the free wind sweeping up the valley, but the cheery note of the chickadee, engaged in cracking the seeds of wild hemp, softens the sting of the elements. At other and different times during this month, we have encountered here song-sparrows, goldfinches and redpolls, partaking of this delectable seed, while the adjacent field harbored the snow buntings, horned larks and prairie horned larks. Once a Cooper's hawk, angered or confused by our persistent calling, gave us a violent start.

We discovered beautiful examples of bird architecture, cleverly concealed nests of phoebe, finely fashioned strawy nests of the song sparrow, pendant structures of the oriole, goldfinch and vireo. The secret of the wily indigo bunting at the edge of the meadow is ours, though it led us a merry chase some months previous. Here where the embankments are steep and overhanging, we hear a familiar scolding as of a wren, but in a higher key. It betrays that invincible busybody, the Winter wren, prying into windfalls, rotten logs and caved in embankment for the life sustaining insects and larvæ. The bitter temperature is no deterrent in curtailing shortcuts through the shallowest of water. Persistent wren energy alone could wrest a meat diet now from the solidly frozen earth, but this hardy Northerner simply laughs at hardships and occasionally refreshes itself with an icy bath, clearly denoting its aquatic ancestry. From yonder grove comes the persistent tapping of the hairy woodpecker or its smaller relative, the downy and lusty "Yank! Yank!" of the white-breasted nuthatch assures us of their fateful life's work.

Other signs of life claim our interest also. Here the blackened snow confirms the unerring scent of the squirrels for their hoarded nuts; there a rabbit, rudely alarmed in its shelter of grasses, bounds away over the frozen ground. Another trail with broad toes spread, well clawed, the miniature human heel, records a midwinter forage of a coon during a lull in the weather, and its successful search for acorns under an accustomed tree, and a little later on, we follow the unmistakable tracks of skunk to its den under a cliff, whither a farmer's dog had followed it, and learned a lesson.

We quit the course of the interesting stream and follow the fortunes of another, not so turbulent and less frequented. Alas, to our sorrow, we note that the slender ribbon is frozen for unbroken miles. Wild life is sadly lacking. The temper of the valley portrays truly the temper of the season. But, the strident note of the blue jay and the derisive cawing of the crows in the distance, strive vainly to dampen our ardor for Nature in its January mood.

Listening pays. Listening broadens. Listening educates. It is human to prefer a listener to a talker.

To grow, to advance, to gain friends, learn how to listen. It has been said that even a fool can pass for a wise man if he will but hold his tongue.

It was Disraeli (who knew how to talk) who once remarked: "There is some silent people who are more interesting than the best talkers." He also said: "Silence is the mother of truth."

Carlyle, who wrote more about silence than he practiced it, nevertheless enunciated a worthwhile truth when he said: "Under all speech that is good for anything there lies a silence that is better. Silence is deep as Eternity; speech is shallow as Time."

Silence is essential to contemplation and reflection. And only through contemplation and reflection can we come to know wisdom.

Even if your ambition be to become a good talker, an important preparation is to be a good listener.

You will never make enemies and rarely will make mistakes by listening. You are in danger of making both by careless talking.

Learn to listen.—*Forbes*.

A Town With Walls Covered With Peach Trees

UPON the sunny slopes of the little town of Montreuil, situated several kilometers from Paris, is a network of high walls covered with peach trees that bear fruits remarkable for their form, their pretty bloom with vivid colors and their exquisite and fragrant flesh. For two hundred and fifty years, in fact, the gardeners of this locality, thanks to a good preparation of the soil, to the choice of varieties successively improved and to methods of sensible pruning, have succeeded in obtaining peaches universally renowned.

According to the *Pratique du Jardinage*, of the Abbot Roger Schabol (1774), this unique horticultural industry arose under Louis XIV. A musketeer, Rene Claude Girardot, lieutenant of archers of the captaincy of Vincennes, who withdrew from service in 1697, was the promoter on his estate of Bagolet, as was a horticulturist of Montreuil also, by the name of Pepin, pupil of La Quintinie, the celebrated director of the vegetable gardens of the Grand King at Versailles. Both diffused

the methods already in use toward the end of the XVII century and owed more to chance than to close observations. According to the tradition the inhabitants of Montreuil, having at that time eaten peaches grown at Corbeil, upon trees in the open, threw the pits into their gardens. Some sprang up along a wall and the whim caught them

of raising up the branches laden with fruit and of attaching them to the wall. These good people, having neither rushes nor osiers, made bands out of the pieces of their old clothes and fixed nails in the masonry at the two ends of the worn out cloths with which they wrapped each branch. The peaches took color, acquired more taste and increased in size more quickly than those grown among the surrounding vineyards. Most of the trees rarely froze.

So the gardeners of this corner of the Parisian suburb erected walls in all their grounds, and this custom has become enormously generalized in France since then.

Today, as our photographs bear witness, the same procedure is still followed at Montreuil. The peach demands a good deal of space on an espalier, and, above all, if it is grafted upon the almond is it necessary that it be able to develop over from forty to fifty square meters of wall surface. It adapts itself to nearly all soils on condition that they be deep enough, cool, but not too moist. They are propagated by grafting or budding a dormant eye upon a seedling, almond, plum, apricot or sloe-thorn, according to the case. Thus in the south is found every-

where the peach grafted upon a seedling, whereas if late varieties are desired use is made of the almond as a stock and the tree is planted in good soil. When only moist and shallow soil is at disposal the grafting is done by preference upon the plum—(variety, Black Daucas or St. Julien). If the soil is both shallow and dry, recourse is had to the apricot; finally, if the peach tree is intended for growing in a pot it is grafted upon the sloe-thorn. Some cultivators at Montreuil employ, with success, as a stock the vigorous cherry, St. Lucie, which finds itself at home in all soils.

After the grafting, practiced in the vicinity of Paris, from the month of August until into September, the peach tree is subjected to different forms: oblique (simple or double), palmetto horizontal, palmetto vertical with two, three or four branches. Then it is planted upon a espalier.

There is one general practice: the trees are oriented toward the west or the south, for the action of the rising

sun often causes damage to peach trees exposed to the east, and the north exposure is too cold to ripen these fruits that originated in Persia. In dry and warm soils the walls are always fronted west, although the trees grow well with southern exposure; but the peaches fall before they mature.

In France the Winter pruning of the peach trees is

done during the months of February and March, for the sap is then swelling the flower buds or future fruits, when their plumpness and their dark color permit the productive eyes to be distinguished from the pointed and dark green shoots. Experts can then sacrifice this or that branch quite advisedly.

The gardeners of Montreuil see to it that, following the annual pruning, the main branches producing fruiting branches shall occupy fixed positions. When the main branches are vertical the fruiting branches ought to develop to the right or to the left and when the main branches are horizontal they ought to develop upwards and downwards, like the bones of a fish in relation to its vertebral column.

Once the fruiting branches have been treated according to the preceding principles the peach trees are subjected to the cultural operations of the Spring season and of the Summer, which complete the series of measures intended to insure the future fruiting. These are, according to the case, the disbudding, the paling up, the pinching off the small buds, the pruning in the green, the thinning of the fruits and the removing of leaves.



General view of Montreuil near Paris. The town is surrounded with a network of high walls, which are covered with Peach trees



Pruning a Peach tree on the walls of Montreuil



General view of an espalier during pruning and piling up



Washing the branches with a nicotine solution



Gathering the peaches for the market

The disbudding consists in removing entirely the eyes situated between the one at the tip of a fruiting branch and the two of its base in order to force these to develop so as to obtain replacing buds.

After the disbudding of a peach tree there remains a bud at the extremity of each branch, two at its base and some others spaced at from 10 to 15 centimeters upon the intervening part. To lessen the vigor of too strong growth and in order to bring the growing effort into the more feeble the branch is pinched, that is to say, its soft tip is cut with the finger nails in order temporarily to arrest its growth and to favor the ripening of the wood. At Montreuil, however, many owners do not pinch their peach trees, vegetation being not vigorous there.

In compensation they pale them up, in the dry and in the green, that is to say they fasten the young branches of the tree with the aid of bands upon a trellis, or by means of strips of cloth upon the wall. They arrange the fruiting branches symmetrically according to the ramifications of the main branches, like the bones of a fish around its vertebral column.

The paling up in the dry is performed in March and April, immediately after the Winter pruning, and once only, while the paling up in the green is done several times in the course of June and July. Ordinarily the paling up is begun at the tips of the branches of the tree that are the most vigorous, and ten or twelve days later the retarded branches are attached. The paling up slackens the force of vegetation and furthers the formation of the flower buds.

Besides, one proceeds again, in the course of the Summer growth, to suppress the useless branches: this operation, called pruning in the green, is practiced from June to August when the replacing branches do not grow fast enough or when a fruiting twig does not bear peaches. Then the fruiting branch is cut above the replacing buds spared at its base. If the buds upon a fruiting branch fall before maturity, pruning in the green is likewise practiced.

Pruning, disbudding, pinching or paling up have as their end the control of the tree in view of the future harvests. But it is good also to remove a part of the fruits, for their excessive abundance is detrimental to both their beauty and their quality. It is necessary then to thin out, upon two or three different occasions, by preserving one or two peaches in a cluster; that is to say, at intervals of about ten or twelve meters along the main branch. The first thinning takes place in May, and nearly at the same time as the disbudding. First are cut off the fruits poorly placed, for example, those back against the wall, or those hanging at the ends of branches that are puny. Every discreet horticulturalist ought to show himself prudent in the first thinning and leave three or four peaches in a cluster, for at the time of the hardening of the pit many of the fruits fall naturally. One waits for the end of this critical period before proceeding to the second thinning. In addition, when a subject appears to be too vigorous, the peaches are removed from the branch of which the replacing bud is developing poorly, and one visits again all the espaliers, during the ripening, to remove the damaged fruits.

Moreover, in order that the peach may take on the radiant colors familiar to everybody one removes the leaves covering it while preserving their petioles for fear of destroying the eyes coming out in the axis. The first defoliating takes place a fortnight before the maturing of the fruit and the fruit is uncovered little by little by beginning with removing the leaves that shield it at the side. One has to spare the two upper leaves that may continue to afford shade until a second defoliating five or

six days later. At that time one cuts in two the midrib of the leaves originally preserved and finally, four or five days before gathering, the third removing of leaves takes place. This time one removes entirely the leaves already cut save the petiole, which remains upon the peach. Notice particularly, however, that these last operations ought not be begun except at the moment when the peaches have attained their complete development; otherwise their growth ceases. Practice and experience alone permit one to determine the precise moment for defoliating.

In the meantime, to keep grubs, bugs and other little creatures away, the horticulturalists of Montreuil bathe the trunks with nicotine and dust lysol over the entire espalier.

At last there comes the time of the harvesting. The trees are laden with fruits mellow and exquisite. One must proceed to the gathering of them, which ought to take place after ten o'clock in the morning and above all when the sun is no longer shining upon the walls. The man takes the peach within his five fingers, then, holding it in his hand, by a gentle twisting movement upon its stem, he detaches it from the branch. Next he places it delicately in the bottom of a basket provided with moss. Lastly he brushes the peaches, after they have been gathered, in order to remove the excess of whitish bloom. The gormands of the two worlds can then regale themselves with them.

WINTER PROTECTION

LAST Winter took a large toll of evergreens, trees, shrubs and plants in many sections of the country. Immense damage also was done among shrubbery and trees by rabbits and field mice gnawing off the bark at the surface of the snow.

It is to be hoped that this Winter will not be a repetition of the past one, at the same time it is well to be prepared as much valuable stock can be saved by forethought.

The large evergreens and trees of course will largely have to take their chance as it is not practical to give them much protection, but it is a good time to renew consideration of the planting of windbreaks, and resolve again to plant them next Spring.

Perhaps it will be even possible and worth while to build a temporary windbreak to protect some choice lot of plants that are in danger of injury.

The damage is usually done in late Winter and early Spring so such work can be left until cold weather has actually set in and things are not so rushed. Experience will have taught where a little protection will do the most good. Many claim the damage is done by the sun shining on the plants when they are frozen but plants protected from the dry frosty winds are seldom hurt by the sun, perhaps it is a combination of both.

In the case of seedlings and plants in frames that are given a protective mulch it is well to remember that the mulch also forms a harbor for field mice and other vermin that are as likely to do as much damage as the weather.

Put the mulch on after the ground is frozen and put poisoned corn or take other steps to destroy the vermin before they destroy the plants.—*Exchange*.

Finish each day and be done with it. You have done what you could. Some blunders and absurdities no doubt crept in; forget them as soon as you can. Tomorrow is a new day; begin it well and serenely; and with too high a spirit to be cumbered with your old nonsense.—*Emerson*.

Work for January in the Garden

SAMUEL GOLDING

IN gardening, January is generally regarded as the month for stock-taking, for Nature has called a halt on the activities of outside work. As we cross the threshold of the New Year, we have time to reflect upon our activities in the garden during the year that is past, and to plan for the season to come. We review our successes with gratification, making notes of failures and plans to avoid them in the future.

It is most essential that we know the cause of our failures, otherwise they may be repeated. It may have been that certain soils or situations did not suit certain crops. If the ground has been well manured and still crops do not thrive, but present an anemic appearance, a good dressing of lime often corrects this condition, especially if the land is somewhat sour. It may have been through lack of fertilizer; then the cure is obvious.

Perhaps we sowed some things too early or too thick in our hot beds or frames, with the result that our plants became drawn and weak from overcrowding. Thus precious time is lost while the plants are recuperating, after being planted in their final quarters. Some plants have a bad habit of prematurely bolting or running to seed if sown too early. Celery, for instance, is inclined to this evil. The sowing of some other crop may have been delayed too long, thereby losing the time which was necessary to bring it to that state of perfection desired when the season of harvest and storing is with us once again.

We are often at the mercy of the elements so that failures of certain crops have been unavoidable, but whatever the causes of failure, it is good policy to ponder over them so that it will be easier to avoid them in the future.

If we expect success to crown our efforts during the coming year, there are two most important points to be observed; that is, to do things well from seed time until harvest and to commence at the proper period. Owing to the diversity of the climatic conditions which prevail in this great land, one can only give approximate dates for garden operations. Much must be left to the judgment of the planter as to the conditions that prevail in his locality.

To the amateur (for whose guidance these notes are primarily intended) it may seem somewhat incongruous to speak of work in the garden at this date, when apparently all that goes to make our garden is slumbering under its blanket of snow, and King Frost reigns supreme. However, we can accomplish much that has a great bearing upon the work ahead.

That fascinating hardy annual, the Spring catalog, arrives. The lists of many seed houses are not only works of art, but encyclopædias of all the wants of the garden from January to December. And now is the time to work on that most important task, the seed order, which should receive our earliest attention. Great strides have been made in all departments of horticulture during the last decade, and many worth while novelties, both in vegetables and in flowers, are introduced through the medium of the Spring catalog.

A novelty, however, does not always mean that it is something super-excellent, or more attractive than some of the well-tried varieties. It is advisable to refrain from banking on novelties, and to rely for our main crops on

the well-tried and proved varieties, although we should endeavor to try out the new ones, especially those offered by reputable firms.

From the reports of the various exhibitions held in different parts of the country, one can gather that the season of 1920 was very encouraging from the growers' point of view. The Fall blooming plants in the herbaceous borders were very fine. *Gladioli* and dahlias were a great feature, and I think one would be safe in predicting a great influx into the ranks of *dahlia* enthusiasts during 1921. These flowers apparently have made many new friends; in fact, the same can be said of all flowers throughout the season from Spring to Fall.

John Gerarde said, "If delight may provoke men's labor, what greater delight is there than to behold the earth, as appareled with plants, as with a robe of embroidered work, set with orient pearls, and garnished with great diversities of rare and costly jewels." These words apply with singular force today. New work on the herbaceous borders, shrubberies, and flower gardens can be planned, and color and planting schemes worked out on paper. Any plants which you contemplate securing should be ordered to save valuable time later on, and that your supply may be sure during the rush of the planting season. Also secure your supply of flower stakes, pea brush and bean poles. Look over the stock of tools, insecticides, spraying materials, fertilizers and various sundries that need replenishing.

Regarding vegetables, our efforts during the early part of the month are mainly directed to conservation rather than production. The stocks of roots, tubers, vegetables and fruits stored will require inspection, and those showing signs of decay should be removed. The less fortunate who have no regular storage cellar possibly have to contend with the heat from a furnace, making a too dry atmosphere with the subsequent shrivelling and deterioration unless great care is exercised.

Celery, that has been banked up with litter and dry leaves outside, may have the tops exposed to allow the moisture to escape. Should we get a break of mild and open weather, take care to cover again in the evening.

Where it is possible and greenhouse space available, successions of crops of beets, stump-rooted carrots, spinach, cauliflowers and salads can be sown in a temperature of 40° to 45°, for they quickly respond to the rising temperature and increase of sunlight. They are always much appreciated when produced. String beans and tomatoes are profitable crops to grow, but require more heat than the above-mentioned.

When growing early vegetables, one has always to take into consideration the room at his disposal, and the use that will be called upon for it during early Spring. I cannot too strongly emphasize the fact that there is no gain in an early start, unless you have the room to keep your plants growing, and will not have to overcrowd at a later date. Do not let enthusiasm get the better of good judgment.

Continue to bring in more asparagus, rhubarb, seakale, and chicory to force. If these roots are lifted in the late Fall, and stored in a cool place, even where a little frost can reach them, they will respond more readily when

brought into heat. To force seakale properly, requires a brisk, bottom heat, and it must be kept quite dark, otherwise it will not be properly blanched, and the quality suffers accordingly. These remarks also apply to chicory.

Mushroom growing presents few difficulties where abundance of horse droppings can be obtained. If one does not possess a properly constructed house, they can be grown in a warm cellar or shed. Collect enough material, which should be turned over each day to sweeten the mass thoroughly, to make the bed decided upon. This is generally accomplished when the strong ammonia has gone and the violent heat has subsided. (Some growers mix some loam with the droppings at this stage.) It is then ready to be made into beds, and should be beaten down firmly, and watched for a few days before spawning. Sometimes the heat may rise and we must wait until this has subsided to around 70° or 75°, favorable to the growth of the mycelium. Insert, in spawning, pieces of spawn about the size of a hen's egg, covering the bed with good loamy soil to about three-quarters to one inch in depth. Make it firm. Mushrooms may be expected after a period of six weeks.

Flower beds that have been bearing and are showing signs that their cropping power is on the wane can be watered with tepid water, in which has been dissolved

a good handful of common salt in a five-gallon watering can, as it has an invigorating effect on the beds.

Push on with pruning, and apply Winter spray to fruit trees, for these are two important operations which must be done with care, if we desire first-class fruit. Pruning does not consist of indiscriminately cutting and thinning, and often as much harm is done by too much knife and saw as when they are neglected entirely. One should bear in mind the object in view, with some knowledge of the conditions of the root action, that can be determined by the growth made last Summer. Our main objects are to remove weak and useless wood; to admit light, air and sunshine; to mold the trees into shapely specimens and to convert gross and strong wood into fruitful growth. Gather and burn all prunings and trimmings, as these ashes are rich in potash and are an excellent fertilizer.

Evergreens and flowering shrubs suffer from the ravages of scale and other insect pests and should have attention. Care should be taken that evergreens and specimen conifers do not get heavily weighted with snow. It is advisable to take a long pole or rake and give the branches a sharp shake. Trees are often damaged if not attended to in this way, and their value as ornaments impaired or even ruined.

Wild Flower "Sanctuaries" Proposed

HERBERT DURAND

THE Garden Club of America has inaugurated a practical nation-wide movement to prevent the threatened extinction of many of our conspicuously beautiful wild flowers. It has appointed a Committee on the Preservation of Native Wild Flowers, of which Mrs. F. C. Farwell, 1520 Astor Street, Chicago, is Chairman, and this committee is sending out appeals to owners of country places, urging them to establish wild flower "Sanctuaries."

Excellent locations for such sanctuaries are wooded areas, boggy meadows, the banks and pools of streams, rocky hillsides and other neglected spots, particularly those which are unsuitable for cultivation. Such nooks and corners, by the use of the right native plants, may be made the most attractive features of any place, and safe harbors as well for those choicer varieties, which, through carelessness, or ignorance, are rapidly disappearing.

The "Sanctuary" idea is fine and should receive enthusiastic support from every owner who can provide congenial soil and surroundings for the lovely denizens of our woods, hills and fields. This provision, however, is absolutely essential. For example, a plant whose natural habitat is moist, acid leaf mold, in shade, will soon perish in ordinary garden soil and full sun. An intimate knowledge of indigenous plants, their habits, requirements and methods of self-propagation, is necessary to success. Each variety must be provided with the kind of soil and given the kind of exposure and associations to which it is accustomed. Yet all this is a simple procedure; it requires only the exercise of common sense and securing and following the cheerfully given advice of those who know.

Most good nurserymen offer a number of attractive native plants—the indigenous conifers, Rhododendrons, Azaleas, Kalmias, and other broad-leaved evergreens, the shadbushes, viburnums, dogwoods, ilxes, myricas, clethrass, etc., several of the ferns and many herbaceous plants, like *Mertensia*, *dodecatheon*, *trillium*, meadow and

turk's cap lilies, and hepaticas. The common kinds of both ferns and flowering plants may be transplanted from neighboring wilds, a most agreeable diversion for a day off, or during a vacation. It is, therefore, not difficult to secure the planting material for whatever kind of sanctuary is desired, whether it be along or at the end of a woodland path, a rock garden, a meadow garden, a bog garden, or a water garden. Few lovers of wild flowers know the charm of our native terrestrial orchids, yet even these shy beauties may be obtained and enjoyed and perpetuated by anyone who can comply with their simple but exacting requirements.

The Garden Club of America is also endeavoring to arouse interest in the preservation of American wild flowers, through the education of American school children. Mr. Frank A. Vanderlip, at "Beechwood," his estate near Scarborough-on-Hudson, is responding to this appeal, by installing an out-of-doors living Botany. An area of hillside, meadow, bog and woodland, through which a brook meanders, and which adjoins the campus of the Scarborough school, has been devoted to this purpose. Here some 6,000 plants were put in last October and more will be added until the school children will have available for their instruction an approximately complete collection of the ferns, flowering shrubs and flowering plants of Northeastern America. The enormous educational advantage of such a living and growing collection, as compared with the customary dried herbarium specimens, is readily manifest, and Mr. Vanderlip's example will undoubtedly be followed by many other institutions of learning in all parts of the country.

The "Sanctuary," as applied to birds, has fully proved its worth, as the noticeable increase each year in the number of our feathered friends testifies. That it will be equally efficacious as applied to the wild flowers is not to be doubted. It is a certainty, if everyone who can find a safe haven for the wildings will do his part.

The Greenhouse, Month to Month

W. R. FOWKES

JANUARY is not a very busy month for the greenhouse department, and early February does not call for many changes providing the December needs were attended to. So we shall discuss for a short time that beautiful and much misunderstood class of Nature's gems, the orchid. It is gratifying to note the revival in orchid culture that is taking place in our broad land. The mistaken ideas regarding their cultural requirements have been somewhat clarified by recent writers, and the so-called mysteries of orchid growing are being dispelled.

The more commonly known commercial orchids are the Cattleyas, and they are of the easiest culture, if one or two technical items are studied. I know well that to be a real orchid grower requires many years of study in the best European places, but European culture is not suitable for the United States. The novice will do well to let alone what he reads about orchid culture that is practised there. Our more severe Winters requiring more artificial heat, that dries the atmosphere, has to be combated, and the European rest for orchids has to be modified, for with Cattleyas here the most of them are either growing, flowering or recuperating.

Several Cattleyas now out of bloom having their so-called rest, need a little attention. *Cattleya gigas*, the noblest of the family, flowers from June to July. In order to succeed, keep the plants in a lower temperature than the earlier bloomers. By this treatment they will not shrivel but will have firm bulbs which will in due season send up strong flowering bulbs. The idea is to restrict this capricious variety to make one growth on a small plant annually, and thus successfully give its magnificent blooms in season.

A few cultural details for a mixed collection which can be grown in a temperature of from 50° at night to 60° in the day time, follow:

The lovely *Epidendrum vitellinum* has given its brilliant scarlet spikes during the last eight weeks. It is evergreen. To rest would be disastrous. Give it the lower temperature and spray only on bright days, or not more than three times a week.

Cattleya Percivaliana will succeed with the same treatment.

Cypripediums will stand with success more water at all times, being evergreen also.

The beautiful *Phalænopsis* is now flowering and its resting period is at this time, but give these plants the warm corner of the house, and they should never be dried off, or their fleshy leaves will shrivel. This variety should not be sprayed with insecticides as its roots dislike anything poisonous. After blooming, take the sour compost carefully from the roots and replace with sphagnum moss and small pieces of charcoal. No heat is necessary.

The deciduous *Calanthes* as they go out of bloom should be shaken out and stood perpendicularly in a flat containing the dust shaken from the *Osmunda* fibre or peat, when mixing compost. Keep these bulbs dry. They will start their next year's growth at the base in March and their culture will be noted then in these columns.

Dendrobium Phalænopsis is an evergreen orchid and should not be kept too dry or the bulbs will not be stout enough to give the support necessary for the next growth to flower.

Dendrobium nobile, and *Wardianum* are not evergreens, but deciduous, and are now resting in a carnation house, suspended from the roof and are dipped every Saturday morning for three minutes. With this treatment, the nodules appear along the dried growths, and they can then be taken into warmer quarters and be watered freely. But the idea of resting these *Dendrobiums* is to flower them before new growth appears, and if the lower temperature is adhered to there will be no shrivelled up plants, but healthy and vigorous ones that will repay any care given them, for in orchid culture, Art must assist Nature, and we must not grow weary in well doing. There is no magic art in their culture and when the problem of their period of rest, and how to rest them is understood, it will be a pleasure.

Exhibitors have carnation and chrysanthemum cuttings in the sand, and it is well not to start the latter too soon, or lanky growth will intervene. What is wanted with 'mums is a continuous period of growth, and the transition of the periods of formation of buds will not be so perplexing. Single and decorative kinds need not be propagated until March.

The lilacs that were dug from the garden early in December, and have been at rest in a cold cellar, can now be brought into a cool house. Keep the temperature low for two weeks and the plants will produce good results when forced.

In the meantime, cuttings of lilac shoots, *Forsythia* and *Prunus*, that have now been well frozen can be placed in vases or jars of water in a warm room or greenhouse and will give useful flowers for the home before the potted plants will be ready.

Do not forget the Nectarines in pots in the cold cellar. Bring them in and prune off any dead twigs, but if dis-budding to five eyes was attended to last Summer, little pruning will be necessary. A temperature of 39° at night is sufficient the first two weeks, but see first that the roots are not killing dry, and that the drainage is right.

Poinsettias that have bloomed can be kept dry and laid to rest on their sides in a dry room.

Give *Cyclamen* a light position and if you want stout stems do not feed at all. Feeding makes fat stems that quickly fall over when the sun shines. The compost should be rich enough to carry them through all right.

Lilium formosum or *Harrissii* for Easter can now stand plenty of heat. Do not neglect the aphids that are sure to infest the growth, and apply the proper remedies in time to keep them clean, for Easter is early this year.

Glorinia bulbs can be started now for early blooming and there is no better method than a flat with moss and sand. Just press the bulbs in gently and, if the moss is moist, no water will be necessary until growth has nicely commenced.

Insist on yourself; never imitate. Your own gift you can present every moment with the cumulative force of a whole life's cultivation; out of the adopted talent of another, you have only an extemporaneous, half possession. That which each can do best, none but his Maker can teach him. No man yet knows what it is, nor can, till that person has exhibited it.—Emerson.

Gypsophila (Babies' Breath)

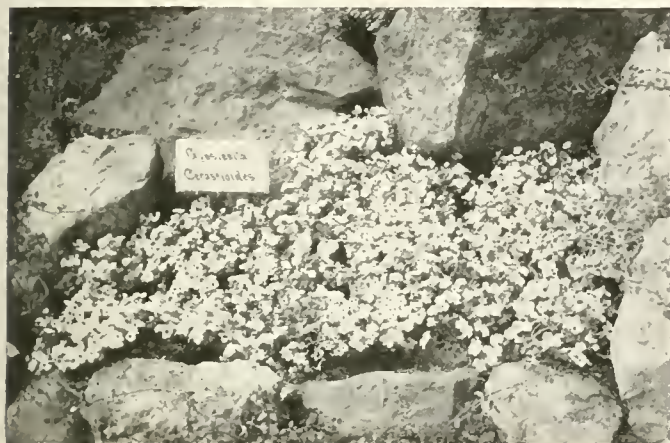
RICHARD ROTHE

FEW hardy garden inmates are better known and more appreciated than the "Babies' Breath" or *Gypsophila*.

One reason for the prevailing popularity is the wide latitude of usefulness of their flowers in a cut stat. The graceful panicles of the annual *Gypsophila elegans*, as well as the perennial species *Gypsophila paniculata*, seem indispensable for mid-Summer table decorations. A few sprays mixed in bouquets, centerpieces or vases take away any stiffness in the forms of common every-day garden flowers, ameliorating colors and, in a general way, help to improve matters perceptibly. To be without a continuous supply of Babies' Breath during the prolonged Sweet Pea season in fashionable northern Summer resorts reflects very badly on judgment. In the eyes of most employers and customers, gardeners and florists minus

factory. I hear, however, of marvelous successes in propagating the double form of *Gypsophila paniculata* in California, and sincerely hope the reports may prove true, for *paniculata flore pleno* is a wonderful improvement.

Less known, and by no means duly appreciated, we find the dwarf growing and creeping species. All are valuable for rockgarden and drywall planting. *Gypsophila ortegioides*, white, blooms in July and August. *Gypsophila repens* is easily grown from seed and propagated by division. It is a splendid subject for dry walls and extremely graceful when in array of its clouds of white blossoms during June and July. *Repens monstrosa* is much stronger in growth than the former, and for this reason more adapted for large rockeries. *Repens rosea* bears pale pink panicles and *Gypsophila Suendermanni* is distinguished by an unusually strong rambling growth. Strikingly attractive are also the two most dwarf species. *Gypsophila cerastioides* is a native of Central Europe, whose white blossoms are marked by finely penciled brown veins, and *Gypsophila transylvanica*, a true little Alpine, bears tiny pure white flowers during June.



Gypsophila Cerastioides

the constantly desired article figure as well nigh complete failures. The simple and easy way of producing the annual kinds by sowings in proper rotation leaves no excuse whatever.

Gypsophila paniculata, the perennial border favorite, while in bloom, serves the same purpose. Here we are at present facing the ever increasing demand for the double flowering form and subsequent problems of its propagation. Seed of *Gypsophila paniculata flore pleno* when sown comes true only about 15 to 20 per cent. Trying cuttings, including those of roots, the results according to my experience are usually anything but satis-



Gypsophila Repens

Gypsophilas require an open sunny exposure, a deep loamy garden soil, and during Winter a mulching of barnyard manure or leaf-covering for protection.

New York's Spring Flower Show

THE eighth International Flower Show in the Grand Central Palace, New York city, opens on March the 14th and continues until March the 20th. The preliminary schedule has been in the hands of the growers and gardeners for some months but the final schedule, which comprises all the cut flower classes, is also now available and if anyone desiring a copy has not received one, a letter to John Young, secretary, 43 West 18th street, New York city, or Arthur Herrington, manager, Madison, N. J., will bring one by return mail.

It is in these smaller classes where many gardeners could, if they would, make exhibits and help materially to augment this part of the show and the Flower Show

Committee solicits the co-operation of the gardeners towards this end. The more there are participating in it the greater the interest, the wider its appeal and the more extensive its patronage.

The plans that have been worked out for this year's show are entirely different from the plans of those that have preceded it. For example; instead of the 500 sq. ft. Rose groups which, by the way, the public have become quite used to, there has been provided this year a class for the best development of a garden covering 1,000 sq. ft. Four such spaces have been laid out in the plan and four entries to fill such spaces have been received. Other

(Continued on page 442)

A Lesson on Plant Physiology and the Plant in Relation to Its Environment

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

IMMEDIATELY after the union, or fusion, of the single staminate and pistillate cells, respectively, otherwise known as fertilization, has taken place, the embryo commences to form. In cross-fertilization this embryo contains all the characters of two lines of ancestors, which characters will continue to remain part of the germ-plasm of the resulting plant, and which are not radically changed or added to by differences in environment. At the same time some characters may become more dominant, and others more or less repressed, but not extinguished, by differences in food, soil and climate.

One of the most important parts in the art of gardening is the working out of methods of supplying such food, soil conditions, etc., and in greenhouses, temperature, which, all together, are known as environment, which will best conduce to the dominance of the characters most desired.

As soon as the embryo comes into existence, the deposit of food for its sustenance during the period of germination commences, resulting in the formation of the body known as a seed. While sometimes an enlarged fleshy ovary, popularly known as a fruit, is brought into existence without the formation of seed, as in the case of the banana, yet, so far as I am aware—except sometimes indirectly in what are called alternations or generations—seed is not produced unless the ovule is fertilized and an embryo formed. In this connection, Nature obviously does not consider it necessary to store up food for an embryo which does not exist. This can easily be observed when shelling peas. Some pods will be found to be perfectly full, others will contain some full-sized peas and also some tiny peas which have evidently stopped at the initial stage of their growth; these latter are unfertilized ovules.

Seeds contain all the necessary ingredients for the building up of the plantlet which results when the embryo starts to grow, or commences to germinate, which germination is not complete until the plantlet is able to gather its own food from the soil and air. Plant food is stored up in the seed in the form of proteids, carbohydrate (starch), fat and mineral salts. The proportions of these ingredients vary in seeds of different genera and species. Thus in corn, wheat, and in other seeds from the same order of plants, starch is the predominating ingredient; in leguminous plants, such as peas and beans, proteid occupies the larger position; while the seeds of flax and cotton are remarkable for their excess of fat, which fat is extracted in the well known cotton-seed and linsed oils. These stored up materials have to undergo certain changes before they can be utilized by the germinating embryo, the manner of this will be taken up later.

As seeds of their kind vary in size, there is a greater amount of total plant food in heavy than in light weight seeds, and the additional reserve food in the larger seeds enables the plantlet not only to reach a more advanced stage of growth before being compelled to collect and assimilate food from outside but the two processes may go on together. Also the largest seeds invariably contain the strongest embryos, therefore the combination of an especially virile embryo and an extra supply of food will, all other things being equal, result in a plant of considerably greater vigor than would be the case from small seeds.

This has been practically proved, amongst other ways, by commercial growers of lettuce under glass, who are able by only sowing large seeds to raise one more crop during the Winter than when unsifted seed is used. In all cases it is therefore cheaper to pay more for properly screened seeds.

It would seem scarcely necessary to emphasize the importance of quality and potential vigor of seeds in crop production, or in other words, their capability to produce the most vigorous plants of which the variety is capable. Another important consideration is the inherent adaptability of the strain of seed to the environment under which it is to be grown.

These considerations as a whole will be affected by the environment of its parents, in which connection the most important points are cultural conditions, soil and climate, and there is no doubt whatever that some strains of seed are better adapted and will therefore produce better results, under some environments than they will under others. Hitherto this point has received little or no consideration from gardeners, although some large commercial growers are aware that seeds produced on certain soils give bet-

ter returns than those grown upon soils of an opposite character, and they act accordingly. Some further points connected with this were considered last month.

In harvesting seed crops, careless methods may produce seed not only of a poor germinating percentage due to the embryos being killed, but may also cause the embryos to be wanting in vigor, so that even when germination takes place they may not have strength enough to produce a plant, and in any case a plant from a weak embryo is never at any period of its life so vigorous as a plant from a strong one. The duration of an embryo's vitality after the seed has ripened varies with the seed's maturity when harvested and with the conditions under which seed has been stored, but why this vitality is more enduring in some species and less so in others, we cannot tell. The fact remains that while seeds of some species will retain the power of germinating for many years, others will lose this power in a few days or weeks. The difference in the time which seeds of various species remain viable are, in one respect, irrespective of the conditions under which seeds are kept; that is to say, it matters not how perfect these conditions may be, the embryos in certain species of seeds will only remain alive for a certain limited period. At the same time, with special precautions and treatment, there is no question that the life of seeds may be greatly prolonged beyond that which we know at present, though never for centuries as is sometimes stated. Cases so reported cannot be taken as evidence of the longevity of seeds.

Numerous assertions have been periodically made about the longevity of seeds which are of little value from lack of detail and of sufficient proof. The most notorious are those concerning seeds from the sarcophagi of Egyptian mummies. It is now generally acknowledged that no adequate proof of this germination has been produced, the reputed success in connection with mummy wheat for instance, being due to the duplicity of Arab relic vendors—in which characteristic they are not at all singular—in palming off modern seeds as being taken from sarcophagi.

The average life of seeds varies greatly with different families, genera and species, but there is no relation between the longevity of plants and the viable period of the seeds they bear. The seeds of trees as a rule lose their vitality sooner than those of annual weeds, for instance. Seeds of coniferous trees lose their vitality in a year or so, and in the case of the Elm, unless its seed germinates within a few days after it falls its power of doing so is lost. It is a matter of common knowledge that many seeds of plants classed as weeds may be buried in the soil for some years and then germinate when brought near the surface. In this latter connection the old saying that "one year's seedling makes seven years' weeding" is easily understood, which would be equally true if the word "ten" were substituted for seven.

The question here arises regarding the advisability of keeping unused seeds over from year to year. It has long been known, and we have previously stated it, that the conditions under which seed plants have been harvested and the degree of maturity at the time of harvesting are factors which play an important part not only in the percentage of germination immediately after harvest, but also in the duration of the seeds' vitality.

Apart from the fact that some seeds have to be sown as soon as ripe and are therefore not handled by seedsmen, there are many kinds which, while their vitality may be retained for some years if stored under proper conditions, soon become useless when such conditions are detrimental. Many investigators have learned that the rapidity with which seeds with more or less long-lived potentialities lose their power of germination varies greatly with the section of the country in which they are kept. The loss of vitality is especially marked in the case of seeds stored in places of relatively high humidity. The rapid deterioration of seeds in localities having a humid atmosphere has become a source of much embarrassment to seedsmen. Many difficulties in shipping seeds to the Gulf of Mexico for instance are a matter of common experience, as in that district seeds, which in other localities keep for some years, lose their vitality in a few months. Experiments with twelve species of garden seeds, stored under identical conditions otherwise, possessed the power of germination after a lapse of six months, 60 per cent greater at Ann Arbor, Mich., than at Mobile, Ala. This shows that seeds retain their vitality

much longer in some sections of the country than in others, and the part which the environment surrounding a seed plays in its germinating power is of much more importance than is generally supposed.

While species differ in a decided manner with respect to the length of time in which vitality is maintained under what may be termed artificial conditions, and this is true however ideal these conditions may be, there is no doubt that the life of a seed is dependent upon many factors, but the one of the greatest importance governing the life of seeds artificially kept is dryness. Probably the best method of keeping seeds in small quantities is to have them perfectly dry and place them in an equally dry fruit jar and screw down the top upon a rubber ring so that the jar remains air-tight. In this way peas, beans, radish, cabbage, melon, and others allied to these, may be kept over, but it is not worth while doing so with parsnip, carrot, onion, lettuce and herbs generally, as these latter soon lose their vitality. With flowers, new seed is invariably advisable. In all cases a germination test should be made of kept over seeds before sowing time.

While the entire round of plant life is wonderfully intricate and extremely interesting, there is no phase of that life more so than seed germination, unless we class as still more wonderful the fact of a plant transferring its life to its seed, which seed, while to all appearance dead, contains under normal conditions, a living germ. This small germ, in some cases invisible to the naked eye, contains within it all the characters and potentialities of its parents. While this germ can, under certain possibilities, be easily destroyed, it is at the same time under some possibilities difficult to kill. When perfectly dry it is not killed under a temperature as high as 212° F., and it will also withstand a temperature as low as 70° F. below zero. The seed is practically a perfect plant in an embryonic state, and it is so designed that it will survive conditions which would be fatal to the plant itself.

Generally, seeds which are buried deeply in the ground retain their vitality for a long period, in fact, much longer than under any method at present devised for keeping them artificially. Reliable evidence has proved that both red and white clover seeds, amongst others, will germinate after being buried for thirty years at a depth of three or four feet.

Neither by the use of the most powerful microscope, nor by the most delicate chemical analysis, can we determine whether the embryo of a given seed possesses any vitality or not. The vitality of seeds can only be determined by a germinating test, which test may be made in the natural way by sowing seeds in the soil, which, provided the seeds are sown under proper conditions, is the most useful method of testing; or by means of several artificial methods, such as placing the seeds between two pieces of flannel or cloth kept continually moist in a warm atmosphere, or by placing them in a laboratory seed-tester. If one sends a sample of seed to their State Experimental Station for testing, they will sooner or later receive word that the seed germinated so much per cent, which means that a certain number of seeds were viable inasmuch as the embryos they contained had sufficient life to start into growth, or sprout. Properly conducted laboratory tests are carried out under ideal conditions as regards temperature and moisture, and such tests will always give a higher percentage of germination than is generally possible when the seed is sown in the ordinary way in the soil. Further, in nearly, if not quite, all samples of seeds there are always some in which the embryo, while having sufficient vitality to start into growth by sprouting, is not sufficiently strong to complete the act of germination, in other words, to produce a plant. For this reason, as well as for others which will be apparent as we proceed, we may calculate that from a sample of seed which under a laboratory test will show a germination of 80 per cent, will not give more than 40 per cent which will produce perfect plants when sown in the ground under ordinary conditions. Obviously the better the entire environment surrounding seeds after being placed in the soil the greater will be the number of plants produced. It is possible for even viable seeds to be sown with little or no germination resulting. When this happens, the blame is generally put upon the seedsman, while the chances are that the seeds which failed to come up were perfectly good, and that the reason for their not doing so should be sought for in other directions.

The germ or embryo of a good seed is in a state which may be likened to deep sleep; its life is, as it were, arrested, suspended, but under the stimulus of a favorable environment, it awakens, comes out from its coverings, gathers strength from the food stored up for it within the seed, and becomes a perfect plant, part of which appears above ground, while the other part ramifies in the soil searching for food.

A sufficiency of moisture, heat and oxygen are the determining causes which bring about the starting of germination, which causes are only effective when co-operating together. All of the food materials in seeds undergo certain changes during germina-

tion. The chief agents bringing about these changes are ferments, which ferments are started into action when in the embryo, or in other words, at the initial starting point of germination. When seeds germinate the starch is changed into soluble dextrose bodies before it is utilized by the plantlet. This change is brought about by the action of ferments, particularly diastase which is found in all seeds. As germination progresses, some of the starch is oxidized and heat is produced, and under all conditions of soil temperature, the temperature of a germinating seed is higher than it was before germination started.

In germination, the fats are first broken up into fatty acids, and then converted into starch and other soluble carbohydrates, as dextrine and sugars. It is estimated that 887 parts of fat will produce 1,700 parts of starch simply by the addition of oxygen from the air. In the oil seeds about twice the amount of reserve food is stored up in the same space in the form of fat as in other seeds in the form of starch.

The proteid compounds of seeds, which are mainly present in insoluble forms, are rendered soluble by ferment action. Some of the soluble proteids are broken down into a condition which enables them to be transported through the plant tissues and used as building material. After passing through the cell walls, these compounds are reconstructed into proteids.

As a whole, the changes taking place in the seed during germination are the same as those which occur in the digestion of food in the animal stomach. In the germination process, starch, fat and proteids are changed by ferment action into soluble forms. The diastase and peptonizing ferments are among the most active in producing the chemical changes in both germination and digestion processes.

As above mentioned, the co-operative action of moisture, heat and oxygen is necessary before germination can begin. The action of moisture to soften the seed, which, when placed in the soil, is in an absolutely dry condition, must take place first, and seeds have to be nearly, or quite, saturated with water and the seed-case soft enough for the sprout to break through, before they will begin to germinate. The unfolding and expansion of the embryo is largely due to the great absorptive power possessed by the protoplasm within the cells. When water is obtainable, this power causes all parts of the embryo to be constantly saturated, and the elastic cell-walls are distended until they are like minute inflated bladders. The pressure thus set up aids in unfolding the different parts from their resting place within the seed-case, and enables the plantlet to burst the covering of the seed. Of course, further growth by cell division soon takes place.

In botanical language the outer coverings of seeds—which may be one or more—are given different names according to their exact part in the seed's make-up, and the word seed-case can be taken to include all the various botanical terms used to designate the outer covering of seeds. Seeds differ considerably in the hardness of their coverings, and some take a very long period before the softening process is complete. Some seeds of this character may lie in the ground for weeks, months, or even years, without swelling, and plant raisers have adopted many methods for hastening the process; such as, stratification in moist sand kept just above freezing point all the Winter, and then sowing the seed in the Spring; in some cases soaking in hot water has good effect. Seeds with a hard shell, as with nuts, peach stones, and such like, the shells are first broken, or the same thing occurs in Nature by the action of frost when they are planted in the Fall, in the latter case germination does not take place until the following Spring. The germination of seeds with hard cases, like canna, is hastened by filing a groove through the case.

While all the ordinary garden seeds will, under the usual soil conditions as regards moisture, absorb sufficient water, some require a much longer period than others, and with the latter, parsley, for instance, germination can be hastened by soaking the seeds before sowing in warm water not exceeding 100° F. Care should be taken not to soak the seeds too long, they should be taken out of the water as soon as swollen and sown immediately. It is usually sufficient to place the seeds in water overnight and they will have absorbed sufficient water by the following morning. It is also necessary to have the soil conditions right, otherwise the sowing of soaked seeds may do more harm than good.

After seeds have absorbed sufficient moisture, the next step in starting germination is a high enough temperature, and the seeds of some species and varieties of the same species will germinate at a lower temperature than others. It is interesting to note that the absorption of water will not alone start the necessary biological and chemical changes in seeds; these do not begin until the embryo commences its activity. Unless the temperature is high enough for this activity to start within a comparatively short time after the seed is saturated, it rots.

(Continued on page 440)

Departments of Foreign Exchange and Book Reviews

NEW HYBRID TULIPS

Although there has been no lack of diversity nor of choice among tulips the possibility of obtaining forms actually new did not seem to me imaginary when I began, twenty years ago, the systematic hybridization of tulips.

One of the objects of this attempt was to produce a race of tulips with recurving, or reflexing, petals, in the class of *Tulipa retroflexa* and *elegans*. The results have corresponded to the expectation and the first flower that opened in 1908, as a result of a cross of *Tulipa retroflexa* with a Darwin of pink flower, presented the effect of an iris-flowered tulip, with petals elegantly reflexed and of a bright salmon-pink color heightened by a tinge of carmine a little darker on the outside.

This variety was presented, under the name of *Sirene*, to the tulip experts of London and of Holland who accorded it three first-class certificates (London, Haarlem, Amsterdam). The *Revue Horticole*, always in search for novelties, had caused to be painted, as early as 1914, a colored plate of it, by the artist Mons. Grossens, and if circumstances had not hindered its publication the plate would have appeared six years earlier. In the meantime the superior qualities of the tulip *Sirene* have been confirmed and now we can besides rank it among the varieties ready for early forcing in February.

Of other varieties of the iris-flowered are *Adonis* of an intensely bright pink and *Artemis*, scarlet-pink.

In the number of the lily-flowered tulips I have obtained a good number of tulips absolutely new as to quality and color, which have been received very favorably by the bulb-culture specialists. There can be distinguished three groups.

First, there are some varieties of absolutely pure white, which rank among the better tulips for early forcing.

Albino (Certificate of Merit, Haarlem, 1917, first class certificate and certificate for forcing, Haarlem, February 9, 1920) is a variety that is vigorous, of large globular flower, pure white, with strong and erect stem. The certificates mentioned, which have been accorded at Haarlem in a most rigorous manner, can give an idea of the appreciation this variety has among the experts. Such a list of distinctions could be cited for *Themis*, another variety which permits forcing a fortnight earlier even than the preceding. A third white variety, *Carrara*, is distinguished by its milk-white tint.

A second group is composed of varieties of which the colors are absolutely new or present artistic combinations hitherto unknown.

Hecene is a carmine-red, at the base pure white surrounded by blue.

Ambre is an egg-shaped flower, of terra-cotta color clouded with amber.

Ambrosia, lilac-pink on the outside, is colored salmon-orange on the inside, carrying flowers of Darwin form upon long stems.

Dido is distinguished by the very large orange-red flowers, reflexed with carmine and tinted salmon-orange.

The flowers of *Dulcinea* have a round form, glossy orange-red on the inside, bright red on the outside.

Ilios, violet-purple, at the base dark yellowish white.

Jupiter, a very large flower, bright carmine-pink, at the base yellow on a blue ground.

Leda is remarkable for the warmth of its salmon-pink, at the edges lighter.

Marvel, of an elongated flower, fragrant, old-gold on the inside, salmon-pink on the outside.

Nectar is a flower with pointed petals, brilliant carmine with heart pure white.

Orion produces large flowers of a strange combination of colors, carmine and salmon, copper and other hues mingling together in harmonious fashion.

The third category comprehends the Darwin tulips with yellow flowers. It is known that yellow is lacking in the original race of the Darwins. Crossings with other late yellow tulips have produced several varieties which by reason of their globular flowers, more or less cubical, can be ranked best among the Darwins. As such may be considered the variety *Luna*, of a delicate yellow color.

All of the novelties mentioned have obtained one or more certificates, either at Haarlem or Amsterdam, or at London from the Royal Horticultural Society, but it would be fastidious to make enumeration here.

The series which we have just described is but a beginning. Thousands of seedlings are examined each season of flowering,

and each year some new seedlings flower for the first time. Among them several hundreds have been marked out to be cultivated and multiplied by the vegetative method, and to be introduced to commerce after having been tried by forcing and from every point of view, or perhaps to be rejected, if the first favorable impression should not be confirmed.

In fine one will not be able to complain of a lack of choice of tulips during the coming years.—ERNEST KRELAGE, in *La Revue Horticole*.

GENTIANA FARRERI

Unquestionably the most exquisitely beautiful member of the *G. ornata* set and from every point of view a first-class alpine. In the circumstances it is but fitting that it was an easy winner of the high award of first-class certificate. Like others of its set, it is made up of numerous procumbent stems, freely furnished with narrow leaves, each growth terminated by a solitary erect, trumpet-shaped flower of lovely turquoise blue, interspersed with white internally. No word picture, however, can do the plant justice. Valuable at any time, it is priceless as an addition to Autumn-flowering plants. Wedded to unrivalled beauty is an amiably disposed nature that will render it indispensable.—*The Garden*.

Mr. Reginald Farrer, who discovered this beautiful Gentian in the high alpine sward of the Da-Tung chain (Northern Kansu-Tibet), states that "it is by far the most astoundingly beautiful of its race, reducing *G. verna* and *G. Gentianella* to the dimmest acolytes." Mr. Farrer describes the color as "an indescribably fierce luminous Cambridge blue within (with a clear, white throat), while, without, long vandykes of periwinkle-purple alternate with swelling panels of nankeen, outlined in violet, and with a violet median line." In cool, rich soil in its natural habitat it forms patches a yard across. The robustness of the plant, together with its dwarf habit and great freedom of flowering, makes it a desirable subject for the rock-garden, and it will also be valuable, like some of the other Gentians, as an edging plant.—*The Gardeners' Chronicle* (British).

DIANTHUS ALLWOOD

This new race of hardy garden Pinks, introduced by Messrs. Allwood Bros., Haywards Heath, is the result of some nine years' work in crossing the hardy garden Pinks with perpetual-flowering Carnations. Judging from their behavior, they promise to be of immense importance not only out of doors, but for pot culture as well. For both purposes they are free growing, flower in great profusion, while not the least of their charms is their delicious fragrance. They are perfectly hardy, and are easily propagated at any time by means of cuttings. I have rooted them readily from cutting in Midwinter, placing them under a hand-light in a cool house; the resulting plants were ready to plant out during Spring, and made large specimens the same season.

Planting may be done during Autumn or early Spring; on cold heavy soils Spring planting is probably best. For Autumn planting propagation should take place in July or early August, while for Spring planting I find that cuttings dibbled into cold frames during September give perfect results the following season. They root in a few weeks, and when they have made sufficient growth they should be stopped at the sixth pair of leaves to induce them to break from the base and become bushy. For bedding purposes it is not necessary to pot them, as they transplant readily from the frames, and grow freely in ordinary garden soil. Needless to say, they do best in open positions, such as suit border carnations, and like most members of the *Dianthus* family they enjoy lime in some form in the soil; for this purpose basic slag should prove excellent, or old mortar rubble in heavy soils. Planted nine inches or so apart they grow quickly, and soon cover the ground; grown in the mass they are more or less self-supporting and require very little support from stakes. They flower on long stems, and cutting the blooms induces them to throw up new flowering growth.—*The Gardeners' Chronicle* (British).

FRAGRANT PLANTS

So highly esteemed a quality is fragrance that many a plant is given a place in gardens for its fragrance alone. Some sweet-scented flowers are inconspicuous or not par-

ticularly showy, like those of the Winter Sweet (*Chimonanthus fragrans*); others, like the Rose and Carnation, combine beauty of form and color with fragrance, but the garden that does not contain a few of them is indeed deficient. A very pretty idea sometimes carried out is to have a garden, or one portion of it, entirely devoted to plants which give forth sweet odors. There is no lack of variety, for the list of plants entitled to find a place will be very large, particularly if those whose scent is stored up in their leaves are included. Roses and Carnations and Pinks, Lilies, Irises, Jonquils, Hyacinths and Day Lilies are almost as well known as Sweet Peas and Mignonette (and, by the way, the varieties of Sweet Peas are so numerous that a pretty garden might almost be made of them alone). Then there are Pæonies, Lilies of the Valley, Violets, Rockets, Sweet Sultan, Wallflowers, Woodruff, Musk-scented Mallow (*Malva moschata*), Lavender, Bergamot, Myrtle, Lemon-scented Verbenia (*Aloysia* or *Lippia citriodora*), Balm, Mint and Thyme; and the Evening Primroses, the Sweet-scented Tobacco plant, and the Night-scented Stock, which are best towards evening. Of plants suited for walls, the Honeysuckle is not often enough seen, while some of the Clematises, Jasmine, and the Winter Sweet, with, of course, Roses, supply a large choice. The Winter Sweet blooms even in the open about Christmastime, and its odor is powerful and most pleasing. Magnolias, Mock Orange or *Syringa* (*Philadelphus*), Lilacs, the Almond, and Hawthorns will be welcome where there is room for larger trees and shrubs in the open. These do not by any means exhaust the list, and if further additions are needed there are Sweet Cicely, Sweet Gale, Primroses, and Cowslips, *Alyssum*, Phlox, Rosemary, Yarrow, Southernwood and the Flowering Currant to choose from. One advantage in making such a garden as this is that most of the plants are old-established favorites, and neither difficult to obtain nor expensive to buy.—*Gardening Illustrated*.

THE SHRUBBERY BORDER

The general kinds of bedding and hardy herbaceous plants are not, collectively, suitable for fringing natural shrubberies, and overplanting is detrimental to the desire to attain fine results. First give consideration to such subjects as *Acanthus*, *Hemerocallis*, hardy Ferns, *Saxifraga*, *Hypericum*, *Iberis*, *Polygonatum officinale* (Solomon's Seal), Aster, Foxglove, *Gyncrium*, *Fuchsia*, Lavender, and varieties of *Clematis*, Honeysuckle and *Hedera*; these to a great extent, struggle for supremacy with the roots of shrubs and Conifers. Simple groups of one species are desirable, and should be planted with due regard to aspect and the kind of shrub growing in proximity. If space permits, hardy Ferns and *Hemerocallis* (Day Lily) associate well; whilst *Gyncrium* (Pampas Grass) stands out in relief from a wide encircling mass of broad-leaved *Saxifraga*. *Berberis Wilsonæ* will gracefully overhang a closely planted bed of common Thyme, and bold groups of *Fuchsia corallina* make striking contrast against *Cupressus macrocarpa lutea*. Interesting relief is obtained by employing dwarf flowering plants beneath trees giving light shade; for this purpose, *Asperula odorata* and *Saxifraga umbrosa* (London Pride) should be included. *Polygonum baldschuanicum* makes a pretty picture growing through an evergreen tree, and also on old stumps, although the latter are probably best reserved for *Clematis* and Honeysuckle. The natural form of specimen Conifers growing on the extreme margin should be carefully preserved and encroachment by other subjects prevented.—*The Gardeners' Chronicle* (British).

HARDY SHRUBS FOR FORCING.

Large numbers of hardy shrubs are suitable for forcing, and some of them, such as Rhododendrons, will give good results if merely lifted from the ground and potted. Others, such as Lilacs, species of *Pyrus*, *Prunus* and similar subjects can only be had at their best when grown in pots over a sufficiently long period to become established and active at the root.

It is true that most of the shrubby species used for forcing prove more or less successful when forced if merely lifted from the ground, but there is a great difference in the time they last in flower compared with those specially prepared in pots. Pot-grown Lilacs, for example, will give flowers that keep fresh for several weeks, while those of plants lifted from the ground will only keep fresh for a few days. Where a stock is grown in pots the plants should now be sorted, selecting and standing together all those that are well set with flower buds; at the same time examine and correct faulty drainage. Subjects that have to be lifted from the ground and placed in pots or tubs should be attended to forthwith, that they may have time to make fresh roots before they are forced. Pot firmly and work the soil well in between the roots. The plants should afterwards be stood out

at doors, and the pots protected from the frost by placing leaves or litter of some sort around them. Some of the most useful shrubs for forcing are *Pyrus floribunda* and its variety *atro-sanguinea*; *P. spectabilis* and *P. Scheideckeri*. The *Prunus* family includes the beautiful double flowering Peaches, also *P. triloba* var. *fl. pl.*, *P. japonica*, of which there are two double varieties, rose and white-colored; *P. subhirtella*, and the Japanese Cherries, *P. pseudo-cerasus*.

Spiræas, such as *S. arguta*, *S. prunifolia*, *fl. pl.*, and *S. Van Houttei*, are also suitable for forcing. Of Lilacs some of the most reliable varieties are *Marie Legraye*, *Charles X.*, and *Mme. Lemoine*, double white. *Kerria japonica* var. *fl. pl.*, is an excellent plant that forces readily. *Deutzia gracilis* is also an old favorite for this purpose. *Forsythia suspensa* is also useful, but is excelled by *F. spectabilis*, which flowers with wonderful freedom and lasts in bloom for several weeks in a cool greenhouse. *Nanthoceras sorbifolia* is less commonly used for forcing, but it is a very beautiful plant in flower. Large, pot-grown specimens of *Wistaria chinensis* flower with great freedom, but they will not stand much forcing, and should be brought on gradually in a cool house.

The *Azaleas* of the so-called *Ghent* section include a wide range of beautiful colors. The small, white-flowered, sweet-scented *Azalea Davisii* is very popular for flowering early under glass. *Rhododendron præcox* is naturally early in flowering and excellent for forcing, as also is the variety, *Rosy Bell*. Among the larger evergreen Rhododendrons there is plenty of material to choose from, but all are not adapted for forcing, the most suitable varieties in most cases being those that naturally flower early. One of the best and most dependable is *Rosa Mundi*. It is dwarf, very floriferous and may easily be had in flower at Christmas. Good early varieties are *Boule de Neige*, *Cunningham's White*, *Mme. Wagner*, *Prince Camille de Rohan* and *Pink Pearl*.—*The Gardeners' Chronicle* (British).

COTONEASTER SIMONSII AS A HEDGE PLANT

Those about to plant a garden hedge may be reminded of the value of *Cotoneaster Simonsii* for the purpose. In a comparatively short time it forms quite a good hedge and presents a pretty aspect at all seasons. It is quite easy to keep trimmed, and does not resent this process in the way that some plants do. We know a famous northern nursery where the dividing hedges are all composed of *Cotoneaster Simonsii*, and very pretty indeed they are; while it serves admirably as a dividing and sheltering subject. It is more expensive than Thorn or Privet; but, on the other hand, is less costly than Holly or *Arbor vita*. Another good point is that it is not too fastidious regarding soil.—*The Garden*.

DEPARTMENT OF BOOK REVIEW'S

FERTILIZERS AND CROPS, by Lucius L. Van Slyke, Ph.D., cloth, 8vo., XIV + 734 pages, with illustrations; The Orange Judd Company, New York.

To this volume may be applied fittingly a grand term that in these days of things all practical, when speed and directness and conciseness and swift efficiency are to the fore, is not often met,—*thesaurus*, "a treasury or storehouse; hence a repository, especially of knowledge;—often applied to a comprehensive work like a dictionary or cyclopaedia." It really does, as the Preface claims it does, "not only assemble, in a connected way, the facts and principles relating to soil fertility and plant nutrition"; it follows, "such a preparatory foundation with a systematic, reasonably thorough study of plant foods with relation to practical use in crop growing." It is far from being "a mere collection of recipes giving the number of pounds of different materials to apply to different crops"; for it makes as prominent as possible the vital factors influencing or controlling the effectiveness with which a crop uses the plant food furnished it. The reasons underlying every practice are suggested. Though an academic man, Chemist of the New York Agricultural Experiment Station, the author has for a quarter of a century been in more or less constant touch with plant feeding questions; "he has been enabled to learn the practices, difficulties and needs of the farmer in relation to many problems of crop-feeding." He keeps these needs in view in the handling of the many theories of soil fertility and soil infertility, which are very, very many in these recent times of flux and transition. But while endeavoring thus to be positive in his instruction of practical farmers he keeps a broad-mindedness without which his work would not be of service, as it

is, to classes in agricultural colleges and in high schools as well as to the educational work of granges and other farmers' clubs.

That there is imperative need of such instruction is suggested by another quotation: "The controllable losses of plant food on American farms is fairly appalling, taken in the aggregate. To give, as an illustration, the loss from only a single source, it is a moderate statement, well within the limits of actual truth, that one-third of the plant-food value of the manure produced by the different kinds of farm animals in the United States is lost by carelessness, a loss equivalent to \$700,000,000 a year; and most of this enormous waste, equal in value to an annual wheat crop, is *preventable*." The need of education is suggested further by calling attention to the difficulties met in choosing wisely when it comes to using artificial, prepared or manufactured fertilizers or manures. The names under which they are sold are so many and so misleading. Lack of knowledge concerning them is apt to involve great loss. With the necessary intelligence, on the other hand, the user may himself put together the elements for which in a form already compounded he might pay several times the price. If properly informed the farmer can not only make the manure produced go much further than manure, solid and liquid, commonly does go but he can grow fertilizing material on ground that would otherwise, at the time, be unoccupied.

Following the treatment of farm crops as generally defined there is a chapter given in detail to Garden Crops and there is a chapter entitled Greenhouse Crops, Nursery Crops and Ornamental Plants, the last sub-topic being excellent, as are all parts of the book, but very brief, altogether too brief even for the farmer in these days. The next chapter, concerning Fruit Crops, is, however, a very fine one. After it comes the heading Special Crops: Cotton, Tobacco, Sugar Cane, Hops, Flax, Peanuts. The Appendix consists of a number of tables, carefully elaborated, to show the composition of certain fertilizing materials and of the different crops. A complete Index makes all the items of the work readily accessible. The whole is systematically and thoroughly well arranged. The many tables and illustrations are all clear and impressive.

BIOLOGY FOR HIGH SCHOOLS, by W. M. Smallwood, Ida L. Revelley and Guy A. Bailey; 8vo., XXI + 590 pages, cloth; Allyn and Bacon, Boston.

This is a "meaty" book. It contains an extraordinary amount of very useful information about matters most vital to man from almost every point of view, all presented clearly and attractively, in ways that in fact, it seems could not be improved upon. The illustrations alone, actually totalling 439, constitute an interesting course in that most important of all studies, Life, what it is and how to have it. Of these illustrations, a set are of a character that is novel and that might be imitated in other books of instruction to good advantage. This is a series of portraits of the biologists who have made the largest contributions toward the progress of the study and have done most service to mankind. Such pictures, with the illuminating little biographies attached, stimulate to worthy emulation.

Other outstanding features, of the many commendable features, are the clear and convincing manner in which are set forth diseases of plants and of animals, including the human animal, and ways to maintain health, individual and communistic and a pervading inculcation of appreciation of the beautiful wonders of created life in all its forms. Any boy or girl, who in the high school, under a teacher of the right sort and able, might make a study of this admirable work, in which the publishers have successfully co-operated with their usual proficiency, would have gained much indeed; would be a far wiser and better human. It would not be an easy task to master, but it would be worth the effort.

A LESSON ON PLANT PHYSIOLOGY

(Continued from page 437)

It goes almost without saying that no sample of seed is 100 per cent viable. Then, too, the embryos vary in strength, or in the amount of vitality they contain. Some will begin to sprout and then die, while others have not sufficient strength to push their way out of the ground. These things happen even when the environment is practically perfect. When some or all of the conditions making up the environment are less perfect, then a larger proportion of viable seeds will fail to complete the act of germination.

Sometimes the plantlet exhausts the food in the seed before it emerges from the soil, and of course, this is more likely to happen with light seeds than with heavy ones although if seed is planted too deeply, or the soil conditions are bad, it may happen in any case. If the food contained in the seed is exhausted before germination is complete, that is, before the shoot of the plantlet

has come up above the surface of the ground, growth ceases, because plants cannot assimilate food from outside until the green substance they contain, known as chlorophyll, has been formed, and the formation of this, can only take place in daylight. We learn from this, among other things, that seeds must not be planted too deeply. It may be argued that the shoots of bulbs, tubers, and other fleshy roots, will keep on growing in the dark; this growth, however, takes place by means of the reserve of plant food stored up in these bulbs, etc., in which a similar chemical action goes on as in the seed.

None of the chemical, physiological or biological changes essential to the development of plant food in the soil can take place in the absence of the stored up energy in the soil derived from the sun, and indicated by temperature, and this statement applies with equal force to seeds.

There is for seeds a certain range of soil temperature under which germination is the most rapid, under which the plantlets at the completion of germination are the most vigorous, and which ensures the highest percentage of plants from a given number of viable seeds. The seeds of different species and sometimes varieties of the same species have (1) a minimum temperature at which they will germinate at all; (2) an optimum temperature at which germination is the quickest, and (3) a maximum temperature beyond which germination will not take place. The seeds of plants native to temperate climates will germinate at a lower temperature than those from tropical species. Thus peas will germinate when the soil is as cold as 32° F., while the cucumber, melon, egg plant, must have one not less than 60° F. String beans will germinate at a soil temperature of 45° F., but pole lima beans rarely germinate at a lower temperature than 65° F., although it is safe to sow bush limas when the temperature is ten degrees lower. Seeds of the round seeded varieties of peas will germinate at a lower temperature than those having wrinkled seed-cases. With sweet peas, those seeds having dark colored seed-cases will come up under soil conditions which may be fatal to those with white or very light-colored seed-cases. Seeds which will germinate at a very low temperature will not do so under a very high one. Thus the embryo of peas has been found by experiment to be killed when the soil temperature is over 99° F., while the maximum for corn, melon, and such like, is as high as 122° F. Soil conditions have much to do with successful germination. In a deeply worked, thoroughly drained and pulverized soil, especially if somewhat sandy, seeds invariably germinate better than when the conditions are the reverse; this is especially noticeable when a more or less prolonged period of cold rain occurs after sowing.

As is the case with all living organisms, the embryo of the seed requires oxygen for its development, and without oxygen, even if the other conditions are right, germination will not commence. As a matter of fact, favorable soil conditions for germination are such as to secure an ample supply of oxygen to the upper part of the ground. Careful observations along lines of experimentation have proved in many ways that when oxygen is completely excluded from seeds, which are otherwise under good conditions for germinating, they fail to start. It has been found, too, that even after the embryo has commenced to grow, if the oxygen supply is cut off, growth ceases. A soil in the best condition for germination and for the continual growth of plants must permit the ready entrance of fresh air; in other words, it must be thoroughly aerated and constantly ventilated.

It sometimes happens that after sowing, heavy rain will cause the particles of soil to run together, and soon after, the hot sun will cause the formation of a hard crust upon the surface, a condition which not only cuts off the supply of oxygen, but also prevents the shoots, especially those of the smaller kinds of seeds, from pushing through. This condition occurs more readily in some soils than in others, and gives the most trouble with those containing much clay and little humus. When this condition has been brought about, it is advisable to carefully break the crust with a fine rake, which operation should be done as soon as the surface is dry enough. As a preventative of this condition upon soils liable to it, sprinkling sand along the rows after sowing does good, and in the case of small seeds, they may be covered by hand with a specially prepared sandy compost. Covering the surface of the soil after sowing with sand, is also a preventative of an attack of the "damping-off" fungi, and should always be adopted when sowing seeds in frames or in a greenhouse. The sterilization of sand before using it for this purpose renders the effect of this safeguard the more certain. Small quantities of sand may be sterilized by the use of boiling water or by baking in an oven.

Welfare work is merely applying the golden rule to industry. Welfare work is good for factory, home, and community.—John H. Patterson.

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NEW SUSTAINING MEMBERS

P. S. Straus, Red Bank, N. J. (Thomas W. Head, superintendent); Mrs. Julius Rosenwald, Chicago, Ill. (Frederick W. Sparks, superintendent); Mrs. Harold T. White, Bedford Hills, N. Y. (William Tait, gardener); Robert S. Mebane, Great Falls, S. C. (Andrew Andersen, superintendent); Mrs. Charles Daniels, Sabatis, N. Y. (Peter MacDonald, superintendent), have become sustaining members of the association.

THE PRESIDENT'S MESSAGE

DEAR Fellow Gardeners: At the last very successful convention of the National Association of Gardeners, held in St. Louis, which, much to my regret, I was unable to attend, you were so good as to choose me to be your President for the current year. Having already in 1916, filled this position, it naturally came as a great surprise to me to be selected again, especially when there are within our ranks so many able men, better fitted in many ways to fill the office, than myself. I am a very busy man and would that some one else had been your selection, but I appreciate the honor conferred on me for a second time, and assure you that I will, to the best of my ability, fill the presidency creditably in 1921.

Conditions today are vastly different in the world as compared with 1916, when I was your President. Readjustment is the order of the day in practically all countries, and a steady liquidation of securities, commodities and labor is taking place. We were favored in being but little scathed by the great world conflict, and while we are now eagerly anticipating a trade boom and more prosperous times, it is well to remember that we cannot continue to enjoy good times while other countries of the world, including

those which at awful cost, and with our aid saved civilization, are still suffering acutely. When we can stabilize exchange rates and make a broader market for our products, then, and not until then, will we become really prosperous again. Perhaps you may say what has all this to do with our society and our profession? A great deal more than appears on the surface. Horticulture in times of stress remains more or less stationary. The European war showed us what a great hold it had on the people there, and the way Great Britain, France and other countries have come back horticulturally should surely be an inspiration to us.

I sincerely believe that the work being done for our association should commend it to an increased number of the rank and file of our profession. Even though men should today be holding positions of responsibility and trust and receiving salaries commensurate with services rendered, is not that all the more reason why they should join rather than hold aloof from us? With their aid we can the more easily lift our association to a higher and better plane. Even with the membership dues advanced to five dollars per year, surely the benefits received will be fully worth that amount, and if we really believe we do not derive any benefit, should we not be ready and willing to help others who may temporarily be less fortunate?

It is most encouraging to note the steadily growing list of sustaining members. There is abundant room for a large accretion of members here. There is not, unfortunately, always that hearty co-operation between gardeners and their employers which should exist, and anything which tends to create a better atmosphere and feeling deserves our sympathetic support. The bringing in of more sustaining members so that our list can be doubled in 1921 is surely not too much to ask. As our sustaining membership grows we can reasonably look for a gradual coming of that better feeling and greater appreciation of the work of the gardeners.

Our association has been taking a very active part in the campaign being conducted for a radical modification of the iniquitous and grossly unfair Quarantine No. 37. Our committee on the Quarantine has been very actively engaged to bring about the needed changes, and while I am unable at this time to disclose what we have done, are doing, and will do in the future, and can only report progress, I would state that the committee hopes in the very near future to make an important announcement of what has been accomplished. The outlook for modifications is certainly brighter than it has been at any time.

In the campaign inaugurated at St. Louis against the Sign Board nuisance, the committee has been somewhat disappointed in the lack of co-operation which had been promised to it by several other organizations, if we would take the initiative. This, however, will not in any way deter us in our efforts to bring about an abatement of this national nuisance. The Garden Club of America has voted to co-operate. It is pleasing to note from different parts of our country that individuals, associations, and communities are at last waking up to the realization of this glaring and hideous nuisance.

Our Service Bureau is now becoming widely known, and while there have not been many worth while positions during the past year, the association has had a goodly share of the positions which have been filled. These are not alone local, but national, quite a number of vacancies being filled in the West, Middle West and South. There is no doubt in my mind that in due time country estate owners will turn naturally to our association as a source from which they are to obtain their efficient and trustworthy gardeners. Having paid several visits to the office of Mr. Ebel while in New York last March, I can testify to the growing importance of the bureau and the great care and tact used in filling vacancies.

The question of how to interest young men in our profession is a deeply important one and we have every assurance that the present year will see this movement well under way. Two of the foremost estates in the country are now preparing to receive a number of young men, where they will have opportunities for both practical and theoretical training, and if plans now afoot materialize, the association will have a school of gardening started by one of the large horticultural institutions of this country, where young men, after they have had two or three years'

training on an estate can secure a year or two of training to help round out their work.

At the risk of being considered needlessly pessimistic, let me urge on our membership the continued great need of maintaining a maximum production of food crops. The need for these may not be apparent now with falling prices for cereals, fruits and vegetables, but these low values which benefit the consumer are hard on the producer and the probable result will be a considerably diminished area of our leading staples in 1921. The high price era of labor now ending drained our farms and gardens and made the production of food both costly and difficult. With more depressed conditions we may hope for a gradual migration back to the land, but at all events we shall not be doing our full duty if we do not maintain food production ourselves; urge and encourage others to do likewise; support school and home garden movements, and everything which leads people back to Mother Earth. I yield to none in my love for flowers, but this is no time for us to allow interest in food production to lag.

In order to make the GARDENERS' CHRONICLE OF AMERICA increasingly attractive and useful I appeal to members to send in occasional notes of gardeners' movements, cultural methods, photographs of rare, unique or well-grown specimens, or any other matters of general interest. Short, pithy paragraphs will be appreciated by the Editor, even if not written in flawless English.

Co-operation should ever be our watchword. We should co-operate with similar organizations, either private or commercial as our interests run on very similar lines and many of our problems are equally theirs. Your new President feels that the association should co-operate in every legitimate way with other bodies aiming to advance horticulture; repress existing injustices such as Quarantine 37 has caused and handle other problems, where individual efforts might be unavailing, but where union would be strength.

I cannot refrain from adding a word of commendation and appreciation for the excellent work being done by our hard working Secretary, M. C. Ebel. His work has increased very much since the New York office was opened, and I would urge the members of the association when in the city to call at 286 Fifth Avenue and satisfy themselves how ably the association's Secretary is handling our affairs.

Our next convention will be in New York City and I trust it will be the most largely attended of any yet held. Will you not lay plans now to take a short vacation next Fall and come to the Empire City which is sure to give you a cordial welcome?

In conclusion, I want to say that the National Association of Gardeners holds a warm place in my heart, and I will, to the best of my ability, endeavor to advance its interests during my time of office. With cordial New Year's Greetings to all our members,

Fraternally yours,

WILLIAM N. CRAIG, *President.*

PRESIDENT CRAIG'S APPOINTMENTS

President Craig has appointed the following directors whose term expired on January 1st to succeed themselves for a term of three years:

William Gray, Rhode Island; William Hertrick, California; Albin Martini, Iowa; Thos. Hutton, Connecticut. New directors, Robert Weeks, Ohio; W. H. Griffiths, Michigan; Thos. W. Head, New Jersey; Montague Free, New York, appointed to succeed George H. Pring, Missouri, whose term expires 1923.

General Committee for 1921 Convention, to be held in New York city. Alexander Michie, Locust Valley, N. Y., chairman; J. W. Everitt, Glen Cove, N. Y.; George R. Hale, Oyster Bay, N. Y.; James Stuart, Mamaroneck, N. Y.; John Canning, Ardsley, N. Y.; William Graham, Tarrytown, N. Y.; M. J. O'Brien, Mt. Kisco, N. Y.; A. Bieschke, Noroton, Conn.; Joseph Tansey, Tuxedo, N. Y.; William Brown, Morristown, N. J.; William H. Waite, Rumson, N. J.

Committee on Training Young Gardeners, M. C. Ebel, New York; Montague Free, Gardener, Brooklyn Botanical Garden, Brooklyn, N. Y.; George H. Pring, Horticulturist, Missouri Botanical Garden, St. Louis, Mo.; H. Ernest Downer, Horticulturist, Vassar College, Poughkeepsie, N. Y.

Committee on Sign Boards, M. C. Ebel, New York; Robert W. Cameron, Ipswich, Mass.; L. P. Jensen, St. Louis, Mo.

Committee on Quarantine 37. The committee appointed by ex-President Jensen last year consisting of W. N. Craig, Massachusetts; M. C. Ebel, New York, will be continued.

CAMPAIGN AGAINST THE SIGN BOARD NUISANCE

At a meeting of the Garden Club of America held in New York, the following resolution was passed on the action taken by the

National Association of Gardeners at its St. Louis convention, to combat the sign board nuisance:

Resolved, That the Garden Club of America is entirely in accord with the sentiment expressed by the National Association of Gardeners;

And Be It Further Resolved, That it is the intention of the Garden Club of America to co-operate as far as possible with the National Association of Gardeners and such other organizations as may interest themselves in an effort to eliminate the sign board nuisance which threatens the natural beauty of the country.

Offers of co-operation have also been received from two prominent nursery firms.

H. L. CRANE EXPELLED FROM ASSOCIATION

A committee of the Executive Board, composed of Peter Duff, Thomas Proctor, Robert Williamson, J. W. Everitt and Joseph Tansey, met at the office of the association in New York on January 10 to act on charges filed against H. L. Crane, until recently superintendent of Hubert T. Parson's estate, Shadow Lawn, West End, N. J., of making false statements and submitting a bogus copy of reference in his application to the Service Bureau for a position. The evidence presented to the committee fully substantiated the charges made. Crane, who was invited to be present did not appear to defend the charges against him. After careful deliberation, the committee voted unanimously to expel Crane as a member of the association.

EXAMINATIONS AND CLASSIFICATIONS OF GARDENERS

Owing to lack of space in this issue, Arthur Smith's paper on the subject of gardeners' examinations, presented at the St. Louis convention, had to be withheld for the February number of the GARDENERS' CHRONICLE.

NEW YORK'S SPRING FLOWER SHOW

(Continued from page 435)

group entries already assured to the manager justify him in asserting that the forthcoming show will unquestionably be the best yet held.

There is one feature of the show that has been extended this year, solely in the interest of the private gardeners, and that is the Table Decorations. There is a competition every day from the second day of the show on for private gardeners' tables and the committee hopes to have a dozen or more each day, a hope that should be easily fulfilled if the gardeners will respond as they should. The tables and napery, etc., are all provided and all the gardener has to do is to bring his flowers and the receptacles in which he will arrange them and make his decoration. Tuesday will be roses, Wednesday carnations, Thursday any choice or combination of flowers the exhibitor likes, Friday sweet peas and Saturday orchids.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring thoroughly competent gardeners—in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for.

The Association seeks the co-operation of country estate owners in its endeavor to establish a reliable source to which they can apply with every confidence to secure the services of gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve, or to the member it may benefit.

Those desiring to avail themselves of the services of this Bureau should apply to—

M. C. EBEL, Secretary
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THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you tell me what is the proper nutrient substratum, or what are the chemical stimulants and their process used to germinate the spores of mushrooms? Will a strain of mushrooms continuously propagated from season to season, each time well selected, through the tissue culture method show a more or less "running out" or lower their pathogenicity?—H. S., Pa.

Can one of our readers supply the desired information?—Editor.

Here and There

BY WAY OF THE SOIL

A few years ago in one of the Middle West states the chairman of a Farmer's Soil School predicted some remarkable changes in our future farming. In sense he said:

"When I consider the strides that science and invention are making, I feel that the day is not far distant when the farmer will cease to be a tiller of the soil. Our scientists will invent a means whereby the elements of the soil can be put into a tablet form and made suitable for human food, thereby doing away with the bulky, laborious and time-consuming method in feeding our millions. Then the farmer will no longer be a tiller of the soil, a sower and a gatherer of the harvest. There will be built alongside our creamery and cheese factory another kind of factory to which the farmer will haul the soil of his fields, out of which to be extracted by human hand those life-sustaining elements which, because of human ignorance, must now be withdrawn by plants. The problem of production will then be eliminated, and the ever-perplexing task of feeding ourselves will be reduced to the simplest and most efficient basis. Then and only then can man concentrate his attention on higher things, for it is written, 'Consider the lilies of the field, how they grow; they toil not, neither do they spin.'"

There exists in the history of mankind no processes that are older, more universal, more essential, or more noble than the sowing of the grain and the gathering in and the utilization of the harvest. The growing of plants and the eating of them by man and beast is a part of creation, and no human invention can alter the plan of the God of the earth. The peoples of the world can never subsist on the elements of the soil alone. The human body, as well as that of the beast, requires, most of all, heat and energy-giving substances in form of carbohydrates and similar foods—to say nothing of the fact that the body requires bulk in form of roughage. Energy foods are not generated within the soil, but are manufactured for the most part within the leaves of green plants out of water and the carbon dioxide of the air through the action of sunlight. It seems a part of the Great Plan that the living body should receive its energy and physical power from the sun by way of the green plant. Thus, so long as carbohydrates are necessary to keep the bodily fires burning, so long will plants send their roots down into the mineral world for those mineral elements which are essential for their sustenance, and which in turn are put into forms by the plants to become building blocks in animal bodies. Without the mineral world the vegetable and animal kingdoms could not exist.

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of cotton without soil. Soil is necessary to grow the pig that produces the pork. And soil is necessary to grow the sheep that produces the wool that is made into woolen garments. Food and clothing, the greatest needs of the human race, must come by way of the soil.—*Soil Improvement Committee Bulletin.*

IDENTITY OF MARIGOLD.

The common people mixed things up considerably when they gave the same name to plants of very different appearance or origin. The point comes up in connection with the name of marigold. A correspondent challenges the statement that

Shakespeare referred to the marsh marigold (*Caltha palustris*) when he wrote of "winking Mary-buds." The Standard dictionary refers "Mary-bud" to marigold but considers the latter to be what is commonly known as the pot marigold (*Calendula officinalis*). Neither this species nor the African marigold (*Tagetes erecta*), nor yet the French marigold (*Tagetes patula*) is native to Shakespeare's country and it seems scarcely likely that the poet would have included a garden flower in his picture of the lark rising from the dewy fields. It would seem that if any marigold is meant it should be the marsh marigold which is common in England. To the writer of these lines, however, it

seems more likely that some species of buttercup was intended. Anne Pratt, author of the *Flowering Plants of Great Britain*, also inclines to this view, but the majority of Shakespearian scholars are in favor of *Calendula*. One piece of evidence seems to have been overlooked. The poet makes his marigolds "Ope their golden eyes." Now the question is, which of these plants close at night; or was the opening an assumption on the part of the poet?—*The American Botanist*.

THE VEINING OF LEAVES

Only two of the great groups of plants have true leaves. These are the Spermatophytes, or flowering plants, and the Pteridophytes or ferns. In the Spermatophytes, the two divisions, monocots and dicots have each a separate and distinct kind of veining, and the veining of ferns is different from either. It is customary to distinguish these forms by saying that the venation of ferns is forked, that of monocots is parallel, and that of dicots is netted, but this is far from correctly expressing it. In the netted pattern, for instance, each group will be found to have numerous species in which the veins form a conspicuous network. The student of ferns who relies upon the conventional description of fern venation may be quite embarrassed to find in any good fern collection that perhaps half of the specimens have netted veins instead of the forked veins he expects. Notwithstanding the occasional similarities of venation, however, the leaves of ferns, monocots and dicots are usually easy to distinguish. The difference is not solely in the disposition of the small veins. Along with the characteristically netted or irregular venation of dicots, goes a tendency of the leaf to have several series of veins branching off from one another in a descending order of size and this is the only plant group to be so characterized. In each of the others there is a main vein extending through the leaf with the smaller veins in marked contrast as to size. In dicots the small veins usually form a network with their tips free; in the monocots they may form a network but their tips are seldom free. In the ferns, a network may occur, but if the tips of the veins are free they often end within one of the meshes formed by other veins. In other specimens, however, the veins fork and fork again with no signs of a network. —*The American Botanist*.

SPORTS AND VARIETIES OF TREES

As is well known, there are many forms of trees in cultivation which are not identical with true species. The latter comprise masses of individuals all alike in character, occurring in the wild state over a definite region of the earth's surface. Geographical varieties are sub-divisions of species, differing from one another in only one or two characters, instead of many characters, but like species definitely distributed over a distinct territory. The difference between a true species and a geographical variety is scarcely logical, and is a matter of words only. Thus, the Austrian and Corsican Pines may be regarded either as two distinct species or as two varieties of one species. Inside a species there may be races, namely, varieties which do not differ appreciably in anatomical features, but are distinct physiologically. In the widely distributed *Pinus sylvestris*, the Scots Pine, there are distinct races, which behave differently in various ways, as in the time of opening the leaves, ripening the seed, habit,

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etc. It will be noticed that species, varieties and races, as defined above, are all capable of holding their own in the struggle for existence, and may be spoken of as "natural" groups.

Sports are entirely different, and form a distinct category in the world of trees. A sport is usually a solitary phenomenon, arising either as a sporadic seedling from a single seed or developing out of a bud on a tree, as a single branch with some peculiarity of twig or leaf. A sport then is a freak of unknown causation, not forming a starting point of a new species, as is believed by some evolutionists, but speedily becoming extinct if left to Nature. All the sports in trees are plainly cases of misdirected development; something has gone wrong in the ovule or bud. Many sports are due to arrested development. The tree in its course from birth to old age passes through stages which are comparable to those of an insect; the seedling often differs from the adult form as a larva does from a butterfly. The juvenile Ash seedling has simple leaves. The sport known as the One-Leaf Ash is simply a seedling Ash which has never progressed to maturity, and may be called a persistent larval form. The Irish Yew was found in 1767 as a solitary seedling on a mountain in Fermanagh and is characterized by all the branches being directed vertically and all the leaves spreading radially. This is also the seedling stage preserved. The seedling of the Yew is unbranched in its first year, producing only a leading shoot. In fastigate trees, like the Irish Yew, no true branches are ever produced, the apparent "branches" being merely reduplications of the leading shoot, of which they preserve the direction and the characteristic foliage. In the Fastigate Oak the leaves are different from those of the normal tree being similar to those borne by leading shoots.

Sports, which are of no significance in Nature, are often of interest to man, who cultivates them for use or ornament. They are propagated by grafts, layers or cuttings, though, in rare cases, they may be propagated by seeds. Many sports are of great economic value, as seedless fruits like the Banana, which are plainly of no value in Nature. Amongst trees sports are usually bizarre, and seldom useful; but many are ornamental, particularly those with variegated foliage.

Amongst the sports which are particularly beautiful in this respect are the Silver Holly (var. *argentea regina*), which has pure white leaves. There are similar sports in the French Elm (*Ulmus nitens*) and the English Elm (*U. campestris*). Two Silver English Elms in Kew Gardens are above 50 feet high. In the case of the Lime, the

(Continued on page 446)

BEATING NATURE.

A man came home and found his wife poring over a seed catalogue. She had a long list of seeds written on a sheet of paper.

"This is a list, my dear," she said, "that I want you to buy for me tomorrow."

Her husband looked at the list. Then he laughed. "You want these flowers to bloom this Summer, don't you?" said he.

"Yes, of course."

"Well, those you have put down here don't bloom till the second Summer."

"Oh, that's all right," the lady said, easily. "I am making up my list from last year's catalogue."—*Market Grower*.

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only forms with colored leaves hitherto known are: *Tilia cordata*, var. *aureo-variegata*, Schneider, a sport of the small-leaved Lime, with yellow-spotted leaves; and *Tilia sublanata* var. *variegata*, Szy., a sport of a form of the common Lime (*T. vulgaris*), also with yellow-spotted leaves. There is a tree of the latter kind, about 40 years old, in Kew Gardens, which displays no beauty and can only be looked upon as a curiosity.—*The Gardeners' Chronicle* (British).

ASCLEPIAS TUBEROSA

Of native American floral treasures which are deservedly now becoming popular, this lovely one, with its beautiful flat topped clusters or umbels, is not yet appreciated as it ought to be. The reason is that it is next to impossible to buy plants that give genuinely red flowers. It has been my experience in buying nursery-grown plants that all of them would produce orange or yellow flowers. It has been claimed again and again that the *Asclepias* will not come true from seed; but, knowing how some nurseries sow all the seed collected, I decided to test out this theory.

After several collecting expeditions, covering three years, a collection of real vermilion-scarlet shades was accumulated. After several years waiting, seed was obtained from these plants. All have bloomed and out of over two hundred plants there have not been more than a half dozen that produced yellow or orange-colored flowers. The others are all of a bright orange red and among these there are a dozen that have produced flowers of intense vermilion shades, accordingly I think that one theory has been exploded, namely, that the *Asclepias* will not come true from seed, and another theory has been annihilated, namely, that this valuable perennial is hard to transplant. Such has not been my experience. The plants that I collected were mostly old specimens, some at least ten years old, and not much root was secured with the crown, but every plant grew, and some of these roots lay around until they had commenced to decay.

Ten years' study of the *Asclepias* has convinced me that this superb wild plant has great possibilities. It would be possible to originate early and late varieties, and, if a system of careful seed selection from the brightest red-flowering plants should be kept up long enough, in time a race of such intense scarlet shades would be produced, that this perennial would be largely used as a substitute for Geraniums, though it grows a little taller.

The *Asclepias* is of the same nature as the Peony. It has a long life and can take care of itself better. In fact, it can hold its own without any attention whatever. It would be a waste of time to plant the *Asclepias* in heavy soil, however, for it will freeze out. It is never found growing wild in heavy soil, but a heavy soil would not be a deterrent to an enthusiast. A hole or trench could be excavated, about three feet deep and wide, and filled with sandy soil, the chances are that then the plants would prove hardy.—H. W. GIESCHNER, *Flower Grower*.

SONG OF PLENTY

'Taters in the ashes,
Cider on the shelf,
So fat with plenty
You hardly knows yerself!
Take down the fiddle,
Reel us off a tune,
'Till we scare the red stars
An' dance away the moon.
Ain't the world you live in
Close to heaven's door?
Long time thanksgivin'
An' pass yer plate for more!

—*Atlanta Constitution*.

La France Giant Everbearing Red Raspberry



**BIG JUICY SWEET BERRIES
FROM JULY TO NOVEMBER**

THE bushes grow rapidly, and are covered with firm, luscious, wonderfully flavored berries, with few seeds, from July until freezing weather. The fruit is twice the size of other raspberries and of the same delicious flavor from first to last. Immense branches covered with berries which are constantly ripening.

It is grown in the gardens of J. P. Morgan, Glen Cove, N. Y.; P. S. du Pont, Wilmington, Del.; Chas. M. Schwab, Loretto, Pa.; John D. Rockefeller, Pocantico Hills, N. Y.; James J. Hill Estate, Lake Geneva, Wis.; H. H. Rogers, Southampton, L. I.; and others who demand the world's best.

The La France Red Raspberry is perfectly hardy. It has been carefully tested for years, to absolutely prove its merit.

Fruits early in July, the first season planted, and continues in fruit until frozen. Free from insects and disease. A dozen plants will supply the average family all season, year after year. Plants multiply rapidly.

A Great Money Maker for Berry Growers

It is the best for home gardens and a great money maker for marketing. Awarded medals and certificates by leading Agricultural and Horticultural Societies, including the Massachusetts Horticultural Society, Horticultural Society of New York, The American Institute of N. Y., etc., etc. It pays to buy the best.

Strong, field grown, bearing plants \$1.50 each, \$16.00 per dozen, by prepaid parcel post. Safe delivery guaranteed in proper time for planting if ordered now. Circulars on request.

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Raspberry Farms at Sound Beach, Conn., and Glen Head, N. Y.

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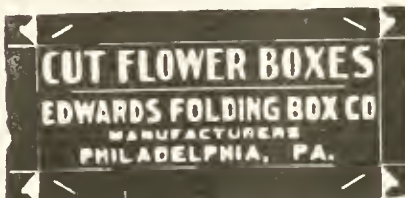
Clean Sand for Propagating Use, or mixing with soil; 100 lb. bags, by freight, unless ordered by express, \$2 per bag. Cash with order.

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MOUNTAIN VIEW, NEW JERSEY

WANTED

High class salesman for nursery stock. One who knows trees and plants and can make good. Answer with reference, and experience.

G. A., *Gardener's Chronicle*,
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Orchid Growers and Importers
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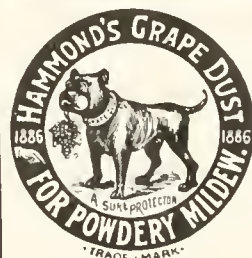
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For the price, it is the best fertility maker for lawns, flowers, vegetables, shrubs and trees.

Special prices on bulk or bag carloads.
H. B. PRINDLE,
101 Park Ave., New York



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Used effectively to kill Powdery
Mildew on Roses and other Plants.

USED BY THE FLORISTS FOR OVER 25 SUCCESSIVE YEARS

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HAMMOND'S PAINT & SLUG SHOT WORKS
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CALCEOLARIA STEWARTII

(Var. Lymanii)

AWARDED

NATIONAL ASSOCIATION OF GARDENERS' GOLD MEDAL
for best new plant (first time awarded)

MASSACHUSETTS HORTICULTURAL SOCIETY'S GOLD MEDAL

THE GREATEST ACQUISITION TO THE COOL GREENHOUSE
SINCE THE INTRODUCTION OF CALCEOLARIA STEWARTII

Plants from 2½ in. pots \$1.00 each
Stock limited.

S. J. GODDARD

Framingham Centre, Mass.

World's Best Sweet Peas

Novelties for 1921

Hand-Picked Seed

There's just as much difference between machined seed and hand-picked as there is between margarine and real fresh country butter. The difference is scarcely noticeable in the price of the seed, but the results are amazingly different. And it is not to be wondered at. Starting with perfectly developed seed such as can only be assured by hand-picking, you get a strong germ which eventually culminates in perfect flowers, in fours, on wand-like stems.

"On Top" in Cleveland

Lake Shore Blvd., Cleveland, Dec. 15, 1920.
Mr. Charles Elliott.

Dear Sir: I am sending for another collection of Sweet Peas from you, as the seeds I had last year were a very great success. I took quite a number of prizes at the Cleveland Horticultural Society June 30, 1920.

Collection of Sweet Peas, Certificate of Merit.

For table effect, first prize.

Five first prizes in single classes.

One second prize.

If this will be any advantage to you for publishing, I shall be very pleased to have you use it.

Yours truly,

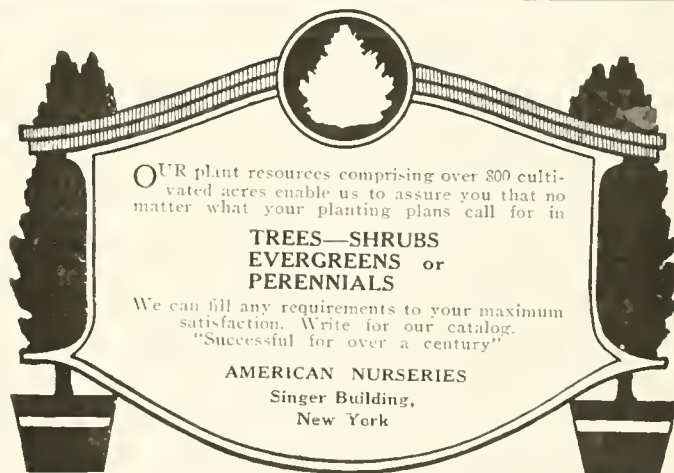
ROBERT BROADFIELD,
Gardener to Mr. Windsor S. White.

Send for Lists of Novelties and Specialties

CHARLES ELLIOTT

Box 337

Park Ridge, Illinois



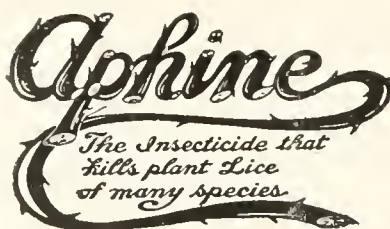
Don't Neglect the Wild Spots!

I am prepared to supply in any quantity the cone-bearing Evergreens, the Rhododendrons, the Mountain Laurel, the Azaleas, the shrubs, the ferns, the native orchids and hundreds of other wild flowering plants that will transform any woodland, meadow, hillside, bog or pool into a spot of surpassing interest and charm.

Send for my unusual catalog, or when in New York, drop in and talk it over with Mr. Durand.

EDWARD GILLET,
Fern & Flower Farm,
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HERBERT DURAND,
286 Fifth Ave.,
New York City.



The Insecticide of Recognized Merit for Greenhouse and Garden

APHINE is a concentrated material—mixes readily in water—efficient in its action—easily applied—free of the disagreeable odors and features of most insecticides—excellent as a wash for decorative plants.

FOR THE GARDEN—As a remedy against all sap sucking insects infesting flowers, fruits and vegetables APHINE is most effective.

FUNGINE—For mildew, rust and other blights affecting flowers, fruits and vegetables.

FOR THE GREENHOUSE

—Applied at regular intervals (once each week or ten days) APHINE will keep plants in the greenhouse and conservatory free of insect pests.

VERMINE—For worms and insects infesting the soil.

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Manufacturers of Agricultural Chemicals

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Sold by dealers in various sizes.

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You will need no doctor's prescription to get coal if you use one of these Karburetors on your boiler or furnace.

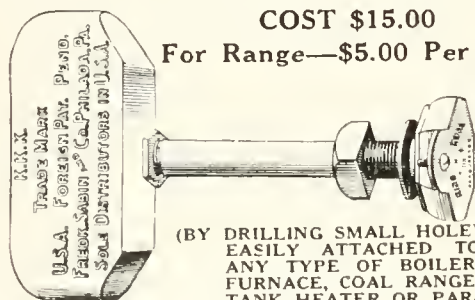
The coal company will be asking you if you want coal instead of your begging them to send some.

No Ash Sifting—No Coal Gas—No Adjustments—No Chemicals

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COST \$15.00

For Range—\$5.00 Per Set



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The comforts and products of a country home are increased by employing a competent gardener; if you want to engage one, write us.

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The Standby of the professional.

The Safe Guide for the amateur.

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You don't have to be very good to figure out why you should own a RICHARDSON BOULEVARD TRIMMER after taking a good look at these illustrations.



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Manufactured by

THE STANDARD SAND & MACHINE CO.
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Frederick Duncan, gardener of the
estate of Mrs. C. H. Goodyear, 888
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A view of the beautiful estate of Mrs. C. H. Goodyear, Buffalo, New York, the
trees of which were entrusted to the expert skill of the Davey Tree Surgeons



The beautiful estate of
Mrs. Goodyear, Buffalo, New York,
saved from death
by the Davey Tree Surgeons. No
traces of internal bracing



JOHN H. H. DAVEY
Tree Surgeon

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The Davey Tree Expert Co., Inc., Kent, Ohio.

Buffalo, New York

Gentlemen: During the past fourteen years that I have been employed as a gardener, it has been my pleasure to see the handiwork of Davey Tree Surgeons on various estates about the country, and note their steady, patient progress.

The work just completed on Mrs. Goodyear's estate appeals to me strongly as being as near perfect as possible under present day standards, and I congratulate you on your wonderful organization. Believe me to be

Sincerely,

FREDERICK DUNCAN.

Every gardener and estate superintendent has a most important work in the saving of the trees under his care.

Davey Tree Surgery brings to his aid the highest development of science plus a generation of experience. A careful examination of your trees will be made by appointment.

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GARDENERS' CHRONICLE

(OF AMERICA)

ILLUSTRATED



*Entrance to
Judge J.F. Maroon's Garden*

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HORTICULTURAL
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Society of American Florists, Silver Medal

American Dahlia Society, Gold Medal



The Splendid New Decorative Dahlia "Patrick O'Mara"

"A MEDAL WINNER WHEREVER SHOWN"

Universally admired and praised by Dahlia Growers, Spectators, and by the Press at the American Dahlia Society Exhibition in New York last September

This Dahlia Brings Profit to the Professional and Credit to the Amateur

AFTER cutting, shipping and exhibiting the flowers four days, where the temperature was high and the wind across them bad, they looked almost as when fresh cut.

*A wonderful, large, beautiful flower
Ships well and keeps a long time*

The blooms are 8 inches or more in diameter, on long, strong, straight stems, firmly set at right angles, close to the stem which holds the heavy flowers without drooping. The petals are firm and compact, showing no open center. THE COLOR, an unusually soft, and pleasing shade of orange-buff, slightly tinged with Neyron rose, more pronounced on the reverse side. A rare, beautiful and taking autumn shade. Sure to be in great demand for commercial use and ornamental gardens.

HIGHEST SCORE at the trial grounds of the American Dahlia Society, at the Connecticut Agricultural College under ordinary field culture, which gives results that any grower may expect to equal.

"Its growing, keeping and shipping qualities are excellent. Growers will find its habit, color, etc., something that has been greatly needed. It was the outstanding variety of the trial garden both as to habit of growth and the way it holds the flowers on the strong stems well above the foliage; a splendid keeping variety." Prof. Geo. W. Fraser, Connecticut Agricultural College.

Chicago, Ill., Oct. 28, 1920

The box of blooms of Dahlia Patrick O'Mara came safely. Although the box seems to have been in the hands of the express company for something like fifty-six hours, the flowers were in remarkably good condition. The firm texture seems to give this novelty, shipping qualities quite exceptional in the Dahlia. The blooms have attracted much favorable comment from visitors to our office.

Yours very truly, Florists' Review.

Orders booked now and plants shipped next Spring in the rotation in which orders are received. Price \$10.00 per plant, \$100.00 per dozen. Tubers will be sent on orders from distant points. Safe delivery guaranteed.



"Plate of flower for framing, in natural size and colors sent FREE on request."

**RICHARD VINCENT JR.
& SONS COMPANY
WHITE MARSH, MARYLAND**



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Burpee's Sweet Peas

THERE is always a ready demand for good Sweet Peas. Well grown flowers realize most remunerative prices, and it is doubtful if any other crop will bring the florist greater profits, considering the outlay for stock and the ease with which the crop is handled.

To ensure flowers of highest quality and at a time before the market is glutted with ordinary stock, the seed should be sown during January or February in pots. Start them in a cool house or even a cold-frame, and so have first-class sturdy plants for setting out in the open field early in April. This method will give you flowers in late May, and much superior to those sown directly in the open.

When ordering ask for our leaflet on Sweet Pea culture. The House of Burpee is recognized the world over as American headquarters for Sweet Peas. Burpee's Sweet Peas are grown and developed on Floradale Farm, our California seed ranch, and our strains are unsurpassed for high-class quality and "trueness" to type and color.

Good Sweet Pea seed is scarce this season, due to short crops, and as our stocks of some varieties are limited, we suggest early ordering.

The following list includes only such varieties as we know to be of value for market work. For fuller descriptions and classified list of all varieties, including many novelties now offered for the first time, write for Burpee's Annual, which is sent free upon request.

BLUSH

Elegance. Blush pink.
Agricola. White, flushed lilac.

LIGHT PINK

Daisybud. A rich color.
Elfrida Pearson. A fine pink.
Cis Wright. Pink on cream.

CREAM-PINK

Margaret Atlee. Deep pink on cream.
Mrs. Routzahn. Buff-pink.

ORANGE-SCARLET

The President. Dazzling orange-scarlet.

CERISE

Illuminator. Rich cerise-salmon.
Fiery Cross. Bright orange-cerise.

CRIMSON

King Edward. Deep crimson.

BLUE

Hedgwood. Deep azure-blue.
Blue Monarch. Dark blue self.

SALMON

Barbara. Salmon-orange.
Stirling Stent. Deep salmon.

SALMON-PINK

Beryl. Soft salmon-pink.
Lilian. Pale salmon-pink.
Doris Usher. Salmon-pink on cream.

BURPEE'S EARLY OR LONG SEASON SPENCER SWEET PEAS

To anticipate the blooming season of the Summer-flowering type, we recommend using the Winter, or Early-flowering varieties in the same manner; they will give you flowers two or three weeks earlier, thus considerably prolonging the season.

The best varieties for this purpose are included in the following:

Improved Snowstorm. Immense pure white.

Loveliness. Soft pink.

Pink Beauty. Rose-pink on white.

Daybreak. Rose-pink on cream.

Illumination. Salmon cerise.

Princess. Lavender-mauve.

DEEP PINK

Countess Spencer. Soft rose-pink.
Hercules. Rich pink.
Harlequin Pink. Bright salmon-pink.
Annie Bonnard. Salmon-pink.

ROSE

George Herbert. Rosy carmine.
Rosabelle. Large rose self.

LAVENDER

Margaret Madison. Azure-blue.
Orchid. Lavender-pink.
Florence Nightingale. Rosy lavender.
Don Alvar. Silvery blue.

MAUVE

The Lady Evelyn. Rosy mauve.

PURPLE

Royal Purple. Rich, warm purple.

PICOTEE EDGED

Dainty. White, edged rose-pink.
Cherub. Cream, edged bright rose.

PINK AND WHITE

Blanche Ferry Spencer. Rosy standard, pink wings.
Mrs. Cuthbertson. Rose-pink standard, wings white.

Burpee's
Improved Snowstorm



Mrs. Cuthbertson

W. Atlee Burpee Co.

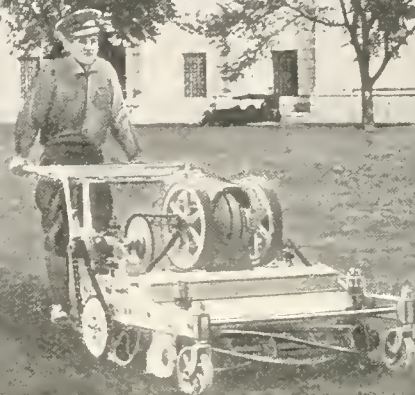
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Coldwell Model "H"
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GREEN HOUSES

FOR
1921



FOR
1921



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ALSO RECENT NOVELTIES AND SPECIALTIES
OF INTEREST TO ALL UP-TO-DATE GARDENERS

Novelties are sent out in original packets

Descriptions are those of introducers

NOTE—The novelties we offer in this list are not our own creations, or, old varieties under new names. But are introductions of some of the oldest and most famous European seed firms.

To be convinced, Send for this Novelty List at once.

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FOR EASTER FORCING

Cold storage extra selected stock. Packed in cases of 250 and 500 each.

Price, case 250 pips, \$20.00; 500, \$35.00

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To obtain a Perfect Lawn—sow early with Burnett's
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Or Burnett's famous "Killarney" Mixture

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THOUSANDS OF AMERICAN
ESTATES *COMMAND SUCCESS* IN LAWN, GARDEN,
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BY USING

BECKERT'S SEEDS
THE BEST SEEDS GROWN

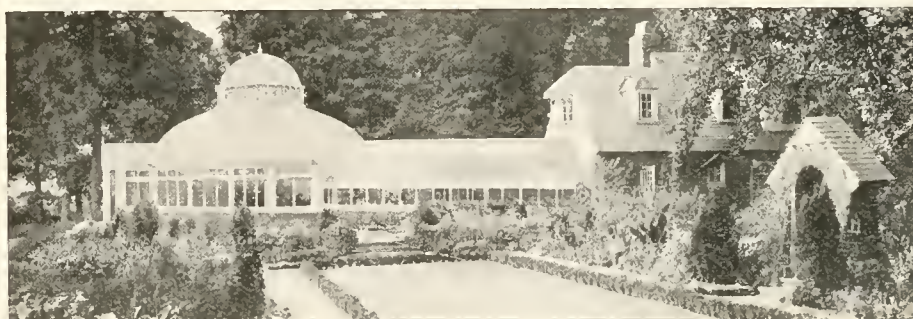
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OF THE ENTIRE WORLD SUIT-
ABLE TO AMERICA

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an up-to-the-minute Handbook of the best strains of
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bulbs, cultural methods, and general supplies for pro-
ducing finer flowers and bigger, better crops.

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In our catalog are several views of this same general plan.
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Glad to send you the catalog.

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For Outside Sowing

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Maroon—WARRIOR

Lavender—R. F. FELTON

Pink—PEACE

Blue—JACK CORNWALL, V. C.

DOBBIES CREAM ROYAL PURPLE

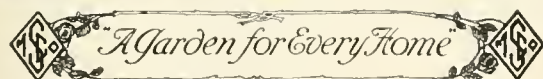
Cerise—ALEXANDER MALCOLM

\$1.00 Per Ounce

The "WORLD'S BEST" Mixture

50c Per Ounce

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Potgrown Polyantha Roses

FOR MAY DELIVERY

Of dwarf habit, they flower practically all summer and can be most effectively used in Rose Gardens or Border planting.

We offer the following varieties in extra strong plants out of 4 inch pots:

BABY RAMBLER—Red, dwarf habit.

ECHO—Soft pink, rather vigorous in growth.

EDITH CAVELL (New)—Vivid scarlet, very brilliant and color never fades.

ELLEN POULSEN—Brilliant rosy pink.

GRETA KLUIS—Dwarf, deep carmine pink.

JESSIE—Bright cherry crimson, fine for massing.

MARIE PAVIC—Snow white with faint flesh center.

MAD. JULES GOUCHAULT—Vermilion red, shaded orange.

MRS. W. H. CUTBUSH—Peach pink.

ORLEANS—Cerise pink with white eye.

OUR 1921 CATALOGUE CONTAINING MANY NOVELTIES WILL BE SENT ON REQUEST.

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145 West 45th Street, New York City, N. Y.

TESTED SEEDS

THE initial cost of the seeds is one of the smallest items in your garden but it is the most important, and you cannot get the fullest results unless you have started right. Henderson's Seeds Are Tested Seeds. Our seventy-five years of seed raising, testing and selling has given us an unequalled experience that is back of every packet of seed we sell.

Everything for the Garden is the title of our 1921 catalogue. It is our Diamond Jubilee number and is really a book of 168 pages with 8 colored pages and over 1,000 halftones, all from actual photographs, showing actual results without exaggeration. It is a library of everything worthwhile, either in garden, farm or home.

We will mail it to you without charge if you will mention THE GARDENER'S CHRONICLE.

Peter Henderson & Co.

35-37 Cortlandt St.

New York City

Scientific Lawn Care

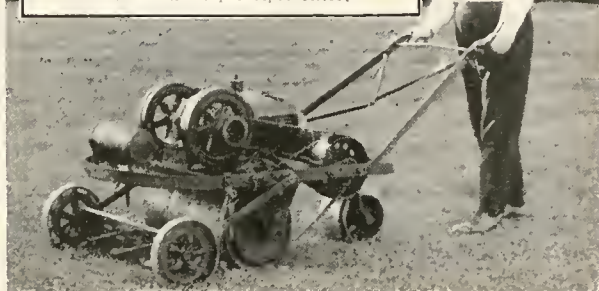
The smooth, beautiful, velvety lawns are those that are cared for scientifically. Where the sod is kept well rolled and the grass cut at intervals frequent enough to prevent too long a growth.

The Ideal Power Lawn Mower makes the care of large lawns a simple and easy matter. Large areas of grass are cut without effort and at small cost.

Moreover, as the Ideal is a power roller as well as a power mower, the sod is kept smooth and firm; and harmful lawn pests are discouraged against invasion. Furnished either with or without riding trailer; also special cutting unit for putting greens. Everyone interested in lawn care should write for a copy of our large illustrated catalog.

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Dealers in all principal cities.



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Does the work of



five hand mowers

Deciduous Trees & Shrubs



OR permanently effective plant decoration about the home, nothing is so economical as the deciduous variety. And, as now is the time to consider their plant-

ing, our service department suggests:—

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Barberry, Silver Thora, Strawberry Tree, Bush Honeysuckle, Snowberry, Snowball, Etc.

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Purple Barberry, Weigela, Golden Privet, Purple-leaf Plum, Golden Elder, Golden Spirea, Etc.

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Barberry, Dogwood, Common Privet, Wax Myrtle, Japanese Rose, Tamarisk, Etc.

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Things and Thoughts of the Garden

MONTAGUE FREE

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GARDEN

CONSIDERING the capricious season we are experiencing, it is quite unsafe to prophesy, but, by the time these notes appear in print we should be in the depth of Winter, and horticultural interests transferred in the main from the outdoor garden to gardens under glass. That this is possible is an important factor in making the horticultural profession attractive, for, in most cases, the gardener is not deprived of the pleasure of seeing living plants growing and blooming even though all outdoors is in the grip of Winter.

When pondering greenhouse matters, the question sometimes arises as to whether we are getting the most out of our greenhouses by the prevailing system of growing plants in pots. Those who attended the 1920 convention of the association at St. Louis, could not fail to have been impressed with the pleasing showing made in those greenhouses of the Missouri Botanical Garden, where benches were eliminated and the collections planted directly in the soil. Even when the material used did not possess any particular intrinsic beauty, such as some of the plants of economic value or those of purely botanical interest, a pleasing effect was produced. Such desirable results may be attributed to several factors. In the first place, planting directly in solid beds provides sufficient soil for plant roots to ramble freely. This, especially in the case of the stronger growing subjects, enables growth to be made that more nearly approximates what one would expect in Nature, and is in striking contrast to the results obtained when the plants are starved in pots. Secondly, one is spared the distractions occasioned by obtrusive benches and inartistic pots. Thirdly, it is possible, provided those responsible have sufficient strength of mind to avoid overcrowding and to rigorously sacrifice when crowding does occur, to obtain results on a small scale comparable to the garden pictures to be seen in the outdoor garden when it has been laid out by a landscape artist with due regard to composition.

We must admit there are difficulties to be faced to achieve this desirable result, and also disadvantages connected with a planted out house, but it is maintained that in many cases the advantages to be gained make it well worth while to take the extra thought which will result, partially at least, in eliminating these drawbacks. There is one obstacle to a successful landscape composition in a greenhouse that can scarcely be eliminated, and that is the house itself. We can never hope to entirely relegate to the background the house structure,

and one must be reconciled to the feeling that the glass is there, but much can be done by skillful planting, especially when the house is of a good size to make it less obtrusive.

The suitable disposition of the heating pipes is as much of a problem in a plant house where the planting is designed to be of beauty, as a whole, as it is to an interior decorator who wishes to obtain best results in a dwelling house. It is a problem that can be overcome, however, in several ways, such as by hiding the pipes behind a retaining wall extending around the house and grading the soil in which the plants are to be planted to the top of this wall. Or, the pipes may be placed below the general level of the house and the openings for the escape of heated air masked by suitable planting.

One difficulty that must be guarded against is the exuberant growth of many tropical plants when given liberal soil conditions and ample head room. This danger can be obviated by planting subjects that will do no more than fill the space allotted them or those that can be kept pruned in without injury.

Probably the greatest drawback to a "planted out" house is the limitation of the number of species it is possible to grow, although more can be maintained in health in a house of this kind than is generally believed. There are quite a number of the smaller plants that appreciate the shade cast by the more vigorous subjects and thrive in the shelter thus afforded. Many ferns, begonias of various species, such trailing plants as *Fittonia*, *Pellionia* and *Selaginella* and many other tropical and subtropical ornamentals fairly revel in such conditions.

However, when the aim is to grow as large a number of species as possible, potted plants must be used. For it is only by growing them in pots that we can control the growth of the more vigorous kinds, induce them not to take up too much room and still keep them reasonably healthy. Then, too, there are many tropical plants that under northern conditions can only be grown successfully when they are kept in pots. Most orchids, for example, are not a great success when planted out. Some absolutely demand pot or basket culture, but with many species novel and interesting effects can be gained and natural conditions approximated, if they are attached to stout branches or planted on suitable rockwork. Material intended for exhibition purposes, small growing flowering plants and bulbous stock in most cases must be grown in pots or tubs.

The most effective and beautiful indoor gardening is

only possible when there is a combination of the two methods, where a suitable selection of subjects are planted out in a show house so that they may attain their full development, and pot grown material, such as flowering plants that cannot be grown to advantage planted out, used to fill in bare places and to provide variety and additional interest throughout the year. All this, of course, implies ample room, a liberal supply of reserve houses and prodigal appropriations for upkeep; but with many of us such conditions seem to be nothing more or less than beautiful pipe dreams.

* * * *

It is all very well to talk and write of the ideal conditions for growing tropical plants under glass, but the tendency appears to be in the opposite direction, and the greenhouse seems to be cutting less and less a figure in horticultural life, except so far as the production of cut flowers is concerned.

Reports from England indicate that there has been a bad slump in indoor gardening; thus E. H. Wilson, writing in the *Garden Magazine* of December, says: . . . "but the death knell of the tender exotics has been rung; . . . the hothouse with its miscellaneous collection of tropical and semi-tropical plants is fast vanishing." His remarks are amply confirmed by other observers.

We are wondering if there is not a tendency towards a similar condition in our own country. We hope it is a mistaken notion, but, excluding vegetables and fruits under glass, we do seem to be developing mainly along the lines of material suitable for cut flowers to the neglect of "the miscellaneous collection of tropical and subtropical plants," to which Mr. Wilson refers. If this is so, it is deplorable, for apart from the intrinsic value to horticulture of well grown specimen plants of Crotons, Dracenas, Anthuriums, *Medinilla*, etc., so dear to the hearts of old time gardeners, we have an opportunity to assume the mantle that seems to be slipping from the shoulders of the European growers. The conditions which operate in Europe to cause a diminution of interest in tropical ornamentals, viz., the high price of coal and labor, combined with increasing interest in hardy plants, do not obtain here, at least not to the same extent. Truly, coal is high priced, labor costs more than it used to do, and there is a gratifying increase in the interest accorded to hardy plants in America. But surely this ought not to cause tender exotics to be relegated entirely to the background. Admitting that coal and labor is high, America is the paradise of millionaires to whom the exudation of sufficient money to maintain a collection of tropical plants is a mere trifle, and surely some of our horticultural enthusiasts are sufficiently catholic in taste to have room in their hearts to appreciate both hardy and tender plants.

* * * *

Whenever there is any discussion of tropical ornamental plants, the name of Veitch is always sure to inject itself in some form or other. Either plants are mentioned that commemorate the name of this world famous firm such as *Pinanga Veitchii* and *Masdevallia Veitchiana*, or the name is recalled in connection with the introduction to cultivation of some plant or other recognized to be in the front rank of ornamental subjects. It is impossible at present to adequately estimate the immense influence the firm of James Veitch & Sons has had in furthering the progress of horticulture. Time must elapse before the full value of some of their later introductions can be appreciated.

Looking over "Hortus Veitchii," a somewhat bald record of the "rise and progress of the nurseries of Messrs. James Veitch & Sons, together with an account of the botanical collectors and hybridists employed by

them, and a list of the most remarkable of their introductions," one cannot fail to be impressed with the magnitude of the contribution this firm has made to horticulture, of the romance and danger attendant on the collection and introduction to cultivation of plants that now grace our greenhouses and gardens, and of the patient endeavor in the field of hybridization.

It should be remembered that it is not only in the introduction of tropical and subtropical plants that this firm will be remembered—their hardy tree and shrub, fruit and vegetable, and herbaceous introductions are perhaps of equal importance. But as being more germane to the present discussion, consider a few names only from the long list of tropical subjects Veitch's have given to horticulture.

Many would accord first place to *Anthurium Veitchii*, a truly wonderful plant when well grown. Immense leaves, five to six feet long, the lateral veins depressed, causing exquisite undulations and the whole enhanced by the metallic sheen of their deep green coloring. The illustration of this plant in "Hortus Veitchii," is of one in the Palmen Garten, Frankfurt-am-Main, but I think the specimen in the New York Botanical Garden is of equal merit, though possibly not quite so symmetrical.

An exquisite ornament for the roof of an intermediate house is *Cantua dependens*, introduced from Peru by William Lobb, one of the earliest of Veitch's collectors. As I remember it, planted in a solid bed in a corridor connecting a range of houses, it was wonderfully beautiful when bedecked with its pendent orange colored blooms fully four inches in length, but cranky in disposition and much favored by the red spider.

Another Veitchian introduction that is also somewhat intractable, although not bothered with red spider, is that remarkable submerged aquatic the Lace-leaf or Lattice-leaf Plant, *Aponogeton (Ouvirandra) fenestralis*. It is seldom that really good plants of this are seen in cultivation. Fine specimens were to be seen in the Botanic Garden of the University of Pennsylvania ten years or so ago, and probably today. Personal experience has convinced me that it objects to growing in a painted receptacle. A fine specimen growing wonderfully in a decrepit, partly rotten beer barrel promptly sulked and grew smaller instead of larger when removed to a similar barrel painted with white on the inside, for the purpose of reflecting the light that the beautifully netted veins could be seen.

Many notable species of *Nepenthes*, *Aeschynanthus*, *Columnnea*, *Dipladenia*, *Eranthemum* and *Lxora* owe their introduction to cultivation to Veitch's. Good specimens of these are not so common nowadays, and it is much to be regretted that they do not receive a wider appreciation. Perhaps we are unwilling or unable to give them the superlative care necessary to maintain them in good condition.

Some of the introductions, however, are to be found in almost every establishment that boasts of a greenhouse. Amongst the orchids such plants as *Cypripedium Lacreanum* and *Calanthe Veitchii*, the latter a hybrid raised at the Chelsea Nursery, are universally grown, and it is a small and meagrely stocked greenhouse that does not contain examples of *Asparagus plumosus*, *Pandanus Veitchii*, *Primula obconica* and some of the innumerable varieties of Crotons sent from the South Sea Islands by the late J. G. Veitch. Another widely grown plant is the "double" Poinsettia, discovered by Roezl in Mexico. "Hortus Veitchii" states that "it proved of difficult culture, and is now lost to cultivation." The double form now grown does not seem to present any exceptional difficulties in its management, and it would be interesting to know if it is identical with the variety distributed by Veitch in 1876.

How to Make a Vegetable Garden and Maintain Its Production

JAMES DONALD

STATISTICS show that vegetarianism is becoming more popular every year, therefore vegetables deserve to be grown more plentifully to meet the increasing demand, and as they are one of the necessities of life, are worthy of careful study, plenty of forethought, and the best of care. The three points to be considered in the making of such a garden are: site, soil and water.

As regards site, the aspect due South or Southeast is always preferable in view of securing more favorably the sunshine of early Spring months and thus making the growing season longer. Level ground is most convenient, although a site possessing undulating slopes, is capable of producing, by proper culture, excellent crops. It is desirable to protect the garden from North winds by plantations, fences, walls, hedges or anything suitable to fill such requirements. Always avoid as far as possible low-lying places as undrained swamps, from the two-fold fact that colder subsoils generally abound and late Spring frosts prevail, both of which cause injury to early crops and are very injurious to perennial vegetables wintered therein.

The next consideration is the soil. A good site may be chosen with poor soil, or vice versa. Of course you can help a great deal to make the soil right, while it would be almost impossible to make the site as Nature herself or the glacier period has solved this problem for us. A collection of different soils in the garden would be a good thing to have at command as different crops need different soils, but this can seldom be had. The quality of subsoil should be examined, and if it is of a retentive nature, and so prevents the free passage of air and water, this has a marked effect on vegetables in general. Land of this nature should be drained freely and especially in districts where the rainfall is heavy, in order to remove the superabundant moisture that would otherwise collect.

The third point is water, and not at all the least important. In supplying water to the garden, in whatever system you adopt, the source should be secured from a stream or large open reservoir, exposed to plenty of sunshine and air. It will therefore be warmer, softer and better suited in every way for plant life, than if obtained direct from a spring or well.

Having these points settled, the next is the tillage of the soil. The ground should be all trenched to a depth of two and a half to three feet. This is seldom done, but in gardens where this system has been adopted, the results have been marvellous. A liberal quantity of manure should be used and cow manure which has no equal in this respect, is the best for vegetables. Horse manure is favorable to early crops, as it is sooner available as plant food, although it does not last as long as cow manure. No strict rule can be laid down as to trenching or manuring. Good judgment should be used, as light soils are often well drained naturally, but may be able to absorb good manuring, whereas heavy alluvial soils may need trenching, but not a heavy manuring. The garden should be plotted into at least four sections, dividing into roads and paths in proportion to its size for convenience and general appearance. These sections may be utilized as follows:

1. For all perennial crops as asparagus, artichoke, rhubarb, strawberries, etc.

2. Peas, early potatoes to be followed by corn, celery, beans, lettuce, etc.

3. More tender kinds as tomatoes, egg plants, peppers, melons, martynia, etc.

4. For all small seeds as onions, carrots, beets, spinach, lettuce, salsify, etc.

Pole beans, cabbage, sprouts, are often planted on the farm if the garden is too small, and each year the cropping of sections can be changed around, so that no crop will follow itself in the same spot next year. Of course in many cases onions are often grown in the same place for years with no marked deficiency.

When Spring comes asparagus is generally the first vegetable to appear. Autumn is the best time to prepare a bed for this delicious vegetable, but Spring is the best time to plant it. Trenching three or four feet deep is absolutely essential, mixing good cow manure with the soil. Seeds or plants may be used, the latter being preferable because they bring quickest results. Use two-year-old plants and do not cut them much until the third year. They may be planted in beds, or in rows two and a half feet apart and eighteen inches between, leaving six inches for a channel for watering while young, and may be filled as they grow. Any extra care given will be amply repaid in future years.

Other perennials as artichoke and rhubarb, the latter may be grown in almost any corner of the garden, give protection in Winter, and a few can be forced early in the Spring by covering with a bottomless barrel surrounded with fresh horse manure. Artichoke can be carried through the Winter the same as rhubarb with protection, or to save time, sow seeds indoors in December or later and these plants will bear fruit the coming Fall.

To obtain success with peas, dig a trench one foot deep and fill in four inches with pure cow manure and cover over with six inches of soil. Then sow deeply; tramp down; cover lightly and leave a channel for water about two inches deep which can be filled in later. Place the brush or wire fencing, the former is the better, on each side of the rows—as in the rush later on this may be neglected—so that the tendrils may get support without delay. Keep up a succession of peas as long as possible, sowing extra early peas first, and filling in with early and late varieties. Adopt this system and you will prolong the season.

Corn may follow peas in the same ground, but it will grow in almost any soil, providing the land is sweet and exposed to plenty of sun. It is a gross feeder and requires plenty of available plant food and extensive cultivation. Plant in hills three or four feet apart each way, or in lines two feet apart or more according to the variety. Do not push up hills as is often done, but keep the land level and the rain force will be equal all over. Simply feed and hoe until the foliage meets.

Celery is often planted alternately with corn for partial shade which is a good asset to it. Seeds may be sown indoors in February or March or in frames later, and planted outdoors after the third leaf appears. Harden off and plant outdoors in cold frames. Celery loves cool treatment but will not stand frost. Plant about four inches apart so that a ball of roots is easily secured for final planting. In their permanent quarters whether on

the level or in trenches, plant in lines four to six inches apart or more, depending upon the depth of soil available for furrowing up. Celery can be well taken care of in its own trenches all Winter or moved into cellars in lines of sand. While in the open, celery keeps in most cases its own nutty flavor at its best, it is of course, far more convenient to get at in the cellars during the long and cold Winter months. With two feet of soil overhead, more or less depending on the latitude of the locality, and plenty of good leaves and manure it will keep well. This method, however, requires much labor.

Leeks can be grown beside celery and placed in trenches like them. As they are quite hardy they can be left outdoors all Winter with little protection.

As a rule, potatoes are planted on the farm and not in the vegetable garden proper. They require a lot of room and would take up a good sized garden to hold enough for an average family, but if a few early ones are desired, they may be planted in the garden about the end of April or May in lines two and a half feet apart and eighteen inches between seeds. When scab is prevalent, soak the seeds in formaldehyde, one to twenty parts of water. The seeds like free and friable soil. Old pasture land broken up is the best. Use fertilizer if necessary; spray well, and often cultivate until foliage meets. This is a standard vegetable and deserves every care and attention to obtain a good clean crop.

Melons, although not classed as a vegetable, deserve a prominent position in the garden. Locate a well drained spot with full sun exposure. Sow seeds about ten inches apart, in boxes twelve inches square. Cover with glass and ventilate as a greenhouse. When plumule appears then take out all but three plants. Let the foliage grow to fill the box; harden off and remove the box. Melons have many pests which we strive hard to get rid of. The best resistant to disease is to keep the plants healthy and growing. Thorough cultivation is essential. Apply liquid cow manure or any fertilizer with good judgment throughout the growing season. Pinch the shoots beyond a flower bud at the limit of the space permitted. Water when necessary—a fountain sprinkler is good in the long cool evenings. Dust dry powder as Hellebore or Shot after rain if aphids are troublesome or any other eating insects. Spray arsenate of lead if beetles should appear after fruit is set, but be very careful in this operation as this fruit is edible. Should rust appear on the foliage spray with a weak Bordeaux mixture. Apply it, say once a week, until all effects of it disappear and the plants regain their normal health.

Cucumbers require about the same treatment as melons. Cucumbers and melons should be grown far apart to prevent fertilization with one another, as they are of the same order and the sourness of the cucumber will soon spoil the sweet taste of the melon.

Lettuce is a favorite salad, and there are many good varieties to choose from, either cabbage or cos. They like cool treatment whether forced or grown outdoors. If sown or planted in a light rich soil and partially shaded in hot weather, they will succeed well. The cos varieties should be tied up before maturity of growth so as to blanch the heart like celery. Sow at intervals, and with the assistance of the greenhouse, lettuce may be had all the year 'round.

Pole beans require a rich soil, well exposed to the sun, so that free circulation of air surrounds each pole. A great drawback is a damp atmosphere, in fact, it is often a cause of failure with beans. Set up poles securely in the allotted space, whether farm or garden, four feet by four feet, in lines. Plant eight or ten seeds to a pole; thin out later to three seedlings; train vines up the poles;

feed and water judiciously, and cultivate until the crop is harvested.

Dwarf beans may be grown in the garden in lines two feet apart, and three inches between the seeds. If sown thinly, plants thrive better. Continue sowing every two weeks until August.

Cauliflower seeds should be sown early in a gentle heat, potted into three-inch pots when the third leaf appears, or when the seedlings are about three or four inches long. Harden off gradually and plant in a good position to get the first batch off before hot weather sets in. Later sowings can be made in cold frames or outdoors to furnish cauliflower in the Fall right up to frost. Plant in lines three feet apart and two inches between. Water well and if the flower is shaded from sun and heavy rains, it will attain a perfect specimen of purity and size. Tie the leaves together, which will act as a good protection. Cauliflowers deserve good care for they are among the most delicious vegetables in the Brassica family.

Brussels sprouts may be treated about the same as cauliflower. They must be sown early indoors as they need a long season to reach maturity. Pot up; gradually harden off; plant outdoors in April or May in lines three feet by two feet apart; stake the plants firmly; feed and water well, and cultivate often. As the sprouts are hardy the plants can be left outdoors unprotected until used on the table.

Squash was the leading vegetable in the war gardens, everybody had squash. The Hubbard and Delicious seemed to be the popular varieties grown. Sow eight or ten seeds to a hill; thin out to three or four when ready; place screens over hills to prevent attacks of insects while leaves are small and tender. This delicious vegetable will grow almost anywhere. It is a gross feeder and can be fed mechanically on milk. Squash has a good vine to cover over an undesirable place, and its foliage alone makes a great attraction at least for the Summer and Fall and until frost.

Parsnips are hardy and will stand the outdoors all Winter, but should have some slight protection in extreme zero weather. If grown for exhibition, unusual methods of culture may be adopted, such as digging holes in lines in a good position in the garden, three or four feet deep, with a crowbar. Fill up the hole with very good soil; sow seed on the surface of the hole; thin out to one plant. Good soil will produce long and perfect shaped roots. In ordinary treatment sow the lines two feet apart, and thin out accordingly. Give good care all season.

Onions prefer a rather stiff, hard soil, but will do well in any ordinary garden soil, providing they get plenty of food, as they are gross feeders. To grow the large onions or exhibition kind, sow seeds in gentle heat in January or February; keep them growing along, potting and repotting. Gradually harden off, and plant outdoors at the first opportunity. Sow outdoors in lines twelve inches apart, or broadcast in beds, but lines are preferable as cultivation is easier. Weed them by hand and thin out with good judgment; water when necessary; feed often and cultivate well. The harvest crop is ready in August or September. Let the bulbs ripen good and keep in a cool, airy place, but do not allow them to freeze.

Egg plants may be sown indoors in a gentle heat and potted in six-inch pots in a good compost of soil, three-quarters soil to one-quarter decomposed manure. Grow indoors until May, and harden off gradually. They should not be planted outdoors before the fifth of June. They thrive very well in a newly started graperly, as they like heat and moisture, but cannot stand the cold. When the nights are warm and when they receive no check, they will fruit and grow luxuriantly.

Peppers can be treated as the former, though being hardier they may be planted earlier in poorer soil. Feed them well, and after the fruit is set, stake and cultivate.

Tomatoes should be sown indoors and potted on into three-, four- and six-inch pots. If the weather is settled by the fifteenth of May, they may be planted out of doors, but watch carefully for frost at night. Set out the plants two feet apart and three feet between the lines. Stake well and keep them tied up all season. Cut out all superfluous branches and if necessary thin the fruit.

Okra and martynia may be sown outdoors in lines three feet apart. Thin out the former to fifteen inches apart and the latter to about three feet. Martynia is good for pickling, and okra makes an excellent flavoring for soup.

Endive is grown almost like lettuce, but does best in the Fall. Tie the leaves together before maturity, so as to blanch like celery. Lay them out on boards ten days before they are required for table use, as they blanch specially well if the foliage is dry. A list of salads that are favorites in the garden is always welcome;

curled cress, water cress, chicory, mustard and radish.

Some herbs are always desirable in every garden and can be raised with ordinary care; perennials as balm, catnip, lavender, fennel, mint, sage and thyme; annuals as anise, sweet basil, summer savory and dill.

Experience is always the best teacher, and no definite rules can be laid down. There should be always plenty of good tools on hand that will assist the gardener in doing his work well. Have a supply of the many insecticides that are required in fighting the numerous enemies of plant life, and see that all spraying apparatus is always in first-class working order. Never have the vegetable garden empty or idle from one season to another. In the Fall when crops have been harvested, dig the ground up and sow it with clover, rye or mustard. Turn this down in the early Spring for it makes a most excellent plant feeder. An old adage, "Dig deep and manure well" is as true today as it ever was.

As said before—Use plenty of forethought, plan before the season and all through it.

Silene (Catchfly)

RICHARD ROTHE

Of the genus *Silene*, belonging to the order *Caryophyllaceae* there are quite a number of biennial and perennial species which readers of a European training will recall as being very handsome garden inmates. *Silene pendula* and *pendula compacta* raised from



SILENE SCHAFTA

seed sown during mid-Summer and grown in the same manner as *Myosotis alpestris* or *Bellis perennis* were freely used for Spring bedding. Their dense cushion-like foliage appeared nearly covered with attractive white or pink flowers which made a beautiful showing during May and June. I always doubted as to whether those biennial species could be grown equally well in our climate. But two years ago I saw a bed of *Silene pendula compacta* in Rosemont, Pa., and the grower assured me there had been no trouble whatever in attaining good results.

Of the hardy perennial kinds the Cushion Pink, *Silene acaulis*, a native of the mountainous districts of the northern part of Central Europe and the British Islands and *Silene alpestris*, a denizen of the Austrian Alps, are both valuable subjects for open sunny positions in rock-gardens. The flowers of the former are pink, rarely white; while those of *S. alpestris* appear in white only. Con-

spicuous by the size of its bright rosy petals is *Silene Elizabethae* inhabiting the slopes of southern Tyrol and the northern part of Italy. Under cultivation the single flower averages 1½ inch in diameter. It thrives well in English rock-gardens while on the European continent, north of the Alps, it calls for a sunny sheltered position and careful Winter protection. Unfortunately in our middle Atlantic climate this beautiful species proves delicate and commercially unsatisfactory. According to my experience the most valuable for American rock-gardens is the Autumn Catchfly, *Silene Schafta*. With the species *alpestris* it shares the quality of being perfectly hardy. The appearance of a plantation of the



SILENE ALPINA

latter during May and June when adorned with its white blossoms is exceeding graceful, while in August and September *Silene Schafta* with its display of bright rose pink flowers proves outright indispensable in adding color to the aspect of our rockeries.

All the perennial species may be raised from seeds sown in Spring or propagated by cuttings and division. For Winter protection a light leaf-covering or a good mulching with old manure is a necessity.

Work for the Month in the Garden

SAMUEL GOLDING

FEBRUARY ushers in the beginning of the gardener's busy season, and by the end of the month the campaign will have opened in real earnest. This does not refer to large establishments where, by up-to-date methods and equipments, production is carried on without a break throughout the Winter season.

Where greenhouses or heated pits are not available, and cold frames the only means at one's disposal to raise the early plants, it will be time to commence towards the end of the month. No doubt plans have been made before now for the coming season for vegetable, fruit, and flower gardens.

Foresight is the one great asset the gardener must possess to cope successfully with the demands that will be made upon him. The needs of the individual establishment and his ability to supply the demand for fruits, flowers, and vegetables at the seasons when wanted, is the most important problem that confronts him.

It is always most gratifying to be able to produce early vegetables and no time must be lost in collecting and preparing materials for hot-beds. Enough should be gathered at one time to fill the pits and frames which we have decided to start with. Methods differ somewhat in the procedure of constructing the hot-bed. If a rapid germination is desired and the hot-bed be placed in an otherwise unheated pit, strawy stable manure with a small percentage of forest leaves can be used, but where a lasting and steady heat is wanted, an equal amount of leaves (oak or beech preferred) and fresh stable manure should be used. It should be turned and thoroughly incorporated, afterwards forked into the pits and treaded down firmly. If on the dry side, throw a few cans of water over it, or sprinkle with the hose when mixing; in a few days fermentation will commence and the bed can then be covered with soil, the depth of which must be determined by whatever uses we intend to make of our beds. If desired only to raise seedlings, just enough soil is necessary to keep down the rank ammonia and too violent heat which is the cause of too rapid germination and consequent damping, making it more difficult to manage after the strong heat has subsided. Where crops of beets, carrots, and spinach are sown about six inches are necessary.

Growers who anticipate exhibiting their produce at the fall shows should now sow their onions, leeks and celery. Sow thinly in flats and as soon as the seedlings are sufficiently large to handle, transplant into other receptacles. Aim to have good stocky plants when the time arrives for planting into their final quarters. This desirable condition is gained by attention to the smaller details. Avoid coddling; keep growing near the glass; and admit an abundance of fresh air wherever the climatic conditions allow. Be careful to avoid cold draughts, especially during the early seedling state, as there is nothing more conducive to mildew or other evils to plant life at any stage of growth.

Other vegetables to be sown include early cabbage, cauliflower, dwarf peas, all kinds of salads, potatoes, string beans, etc. With the increase of sunshine and light, germination quickly takes place.

Ample provision should be made for covering cold frames during severe weather which is often experienced during this month. Snow is one of the best protections

for frames and some caution should be used before removing it, referring, of course, to zero conditions which may prevail. Heated pits should always be clear to take advantage of any sunshine.

Plants for Summer bedding can now be propagated. These include heliotrope, *Coleus*, geraniums, lantanas, *Ageratum*, and salvias. Standards of *Fuchsia*, heliotrope, and lantanas should be grown rapidly. Keep them pinched to furnish shapely heads. Standards make a decided feature in a garden and can be used to advantage in many ways, as pot plants or in beds with a ground work of other dwarf plants, which blend harmoniously with the standards. This is necessary to appreciate fully this style of bedding.

Sow seeds of *Begonia graciles* and *semperflorens*; *Salvia splendens*, *S. patens*, and *S. farinacea*. Seeds of the hybrid penstemon can be sown, which is a most useful and very attractive plant, and deserves to be more widely used for cut flowers or borders. The majority of bedding annuals can be handled more successfully if sown next month.

Seeds of *Delphinium* or larkspur should be sown as early as possible to insure bloom during the coming season. Great improvements, both in size and range of coloring, have been accomplished in the last few years with this wonderful genus of plants, but the old variety *Belladonna* still holds its own as a clear, true blue. It may be lacking in size and probably may be of a somewhat less robust constitution than the hybrids, but it is more reliable when used for the blue border. The dwarf variety *Chinense* is also fine for this purpose, its lasting qualities being only one of its good points. August is a good month to raise seedlings of these plants, wintering them in a cold frame.

Another fine blue flowered hardy plant which can be sown is *Salvia azurea*. It will bloom during September and make a pretty combination when planted with *Artemisia lactiflora*.

Sweet peas should be sown this month in pots or flats, and plunged in ashes in the cold frame where severe frost can be avoided. It is best to sow the new and more expensive varieties singly in small pots; others about four in three-inch pots; or in rows in flats. Use fairly light soil so that when the time for planting is here, the roots will not be broken when shaken out. Avoid rough or half decayed leaf soil for drainage as the roots penetrate this, making it impossible to separate them without injury. Some may ask, "Why shake out the soil?" The answer is that the sweet pea is a very deep rooting plant. When shaken out, the roots are often considerably over a foot in length. It will repay any extra care to endeavor to keep them intact, and, in planting, to get them down as deep as possible, assuming, of course, that the ground was deeply dug and manured last fall.

If we expect success with sweet peas, they must have a good deep rooting medium, otherwise their beauty and usefulness are soon over when the hot weather arrives. If attention is not paid to this phase of their culture, they prove very unsatisfactory subjects, but where conditions suit them, few flowers excel their beauty and abundant returns for the labor expended. After germination, give all the air possible to encourage steady growth.

Walks and Talks Among the Spring Flowers

FLORUM AMATOR

IT is a pure delight to saunter along the paths of our flower gardens in the Spring months and observe the resurrection of the flowers. They remind us of that beautiful old Greek myth of Persephone and her mother Demeter, and its interpretation.

Let us take daily walks together through our gardens, and the Botanical gardens too, if possible, for we find flowers there which we do not see elsewhere, and let us talk in an informal way about what we see during March and in the first half of April.

A large majority of the flowers appearing during this period come from bulbs, but some are from tubers and perennial roots. Such of the bulbs, as are not natives of the United States and their possession, with the exception of *Crocus*, *Hyacinth*, *Narcissus* and *Tulips*, are now forbidden by the Federal Horticultural Board for reasons which appear sufficient to it to be imported from the several sources from which they used to come. Fortunate are they in whose gardens these bulbs are already established.

Let us begin now our garden walks. Here in bloom is the White Glory of the Snow, *Chionodoxa luciliae alba*, with about a dozen white star-shaped flowers, on each stem, a bulbous plant thriving in sunshine or half shade in any good soil in border or rock garden; here also several other species, and varieties of this flower, the Giant Glory of the Snow, *C. luciliae gigantea*, whose blue flowers are larger than those of *C. luciliae*, excellent for grouping in the border; *C. luciliae tmolus*, with blue and white flowers, blooming later than the others and excellent in a rock-garden; the Sardinian species, *C. Sardiensis*, having flowers of Gentian blue on branching stems, thriving in a fertile border; here are two more, *C. luciliae* with white based flowers tipped with blue, about a dozen on each stem growing in any good soil in border or rock-garden; and Allen's Glory of the Snow, *C. Alleni*, differing little from *C. luciliae*.

Now we come upon not more Glory of the Snow, but Snow Drops of several species all with white flowers: the common Snowdrop, *Galanthus nivalis*, whose drooping flowers appear as soon as the snow leaves the ground; *G. clareii*, with more globular blooms than *G. nivalis*; and the Plaited Snowdrop, *G. plicatus*, whose lovely solitary bell-shaped flowers on long stems appear a little later than those of *G. nivalis*. All of these charming bulbous plants thrive in any rich border in sun or half shade.

The Crocuses begin to throw up from their bulbs quaint funnel-formed flowers of several colors; first the Stemless White Crocus, next the deep yellow variety, Cloth of Gold, *Crocus Susianus*, and later, the Cloth of Silver, *Crocus biflorus*; others follow with blue, and yellow and variegated flowers. All Crocuses are suitable for group planting in border or naturalizing in grass ground or under trees.

Here are the Hellebores, six in number. They are throwing up from their roots their cup-shaped blooms of several colors; the much talked-about Christmas Rose, *Helleborus niger*; the tall leaved variety of this, *H. niger altifolius*, whose flowers are the largest of all the Hellebores; also the Olympic Hellebore, *H. orientalis Olympicus*, with smaller and more spreading white flowers; another variety of *orientalis* we see here, the Dark Red Eastern Hellebore, *C. orientalis atrorubens*, with large reddish purple flowers. Look at these very odd colored purplish green drooping blooms of *Helleborus viridis purpure-*

ceus, and these large flowers, purple without, but greenish within and dotted and streaked of another variety of *H. orientalis*, Frau Irene Heineman. The flowers of this variety as well as those of *Olympicus* are good for cutting. Frau Irene Heineman and *H. viridis purpurescens* are suitable for planting amidst shrubbery, and the others in border or rock-garden. All the Hellebores thrive best in a well drained rich soil in half shade, and should not be disturbed often by taking up or dividing.

This pretty little yellow flower comes with the Snowdrops and from a bulb and prefers the partial shade. It is the Common Winter Aconite, *Eranthis hyemalis*.

Now in mid-March the spikes of the pretty Squills, some white, others in different shades of blue, spring up from their bulb mother in the earth to greet us; the Early Squill, *Scilla bifolia*, is the earliest of all the Squills; its starry flowers, about six in each spike of blooms, are, you see, dark blue; here is another early species, *S. Sibirica*, with pretty nodding China-blue flowers on slender stalks, and also its white flowered variety, *S. Sibirica alba*, and another species *S. amoena*, the Star Hyacinth Squill, whose blue flowers, you see, are not, in spite of its name *amoena*, as pretty as those of other species. All the Squills prefer a sandy soil either in sun or half shade, in the border or rock-garden.

Here are some flowers of a quite different form, but also from bulbs, the Netted Iris, *Iris reticulata*, with fragrant yellow crested flowers; there are several blue flowered varieties of this which we do not yet see in flower. Nearby we see Krelage's Netted Iris, *I. reticulata Krelagei*; its flowers we note are not as fragrant as those of *reticulata* or its color as clear. These Irises like a sheltered, but sunny spot in a fibrous or sandy well drained soil.

April is now here with its fickle weather, but its sunshine and its showers, alike bring out the Spring flowers. Though in our garden walks we notice that the flowers from bulbs are still in the majority, nevertheless, we see that not a few plants from perennial roots which are not bulbous are beginning to bloom. This is the White Baneberry, *Actaea alba*, displaying its clusters of snowy white flowers above its finely cut foliage; a little later we will see its white berries. This plant which thrives best in a loose soil and shade is suitable for a rock-garden or wild garden.

We come now upon a pure white sheet of fragrant flowers of the White Rock Cress, *Arabis albida*, excellent for covering rocky, bare places and for edgings. Not far away we see the Alpine Rock Cress, *Arabis alpina*, adapted to the same uses as *A. albida* and with flowers of like color, but smaller, and, like *albida*, loving the sun. Trailing over this rock-garden we see the Running Rock Cress, *Arabis procurrens*.

In the full sunlight here, though it thrives in the shade too, we find the Double Snowdrop Windflower, *Anemone sylvestris flore pleno*, equally at home in the border or the rock-garden.

Growing both in the half shade and also in the full shade of the shrubbery we see the Pepper Root, *Dentaria diphylla*, whose flowers are white above, but pale purple beneath. The root stocks of this plant, which prefers a light peaty soil, are edible.

Here are two Spring flowers very different from any which we have met in our walks, the Squirrel Corn, *Dicentra Canadensis*, with its pendent, pink tipped flowers on leafless stems, and its fern-like foliage, suitable

for rock-garden or border and preferring the half shade. In a like location we find the Dutchman's Breeches, *Dicentra cucullaria*, with its pretty racemes of drooping, yellow tipped flowers, thriving, as *Canadensis*, in a light rich soil.

In this rock-garden we now see a pretty, little odd-looking creeping evergreen plant, with rose-colored buds, and white flowers rising out of a moss-like cushion of leaves growing in half shade or full sunlight and preferring a soil of leaf mold and sand. This is the Pyxie, *Pixidanthera barbulata*, a native plant.

Do you see these pearly white buds and large white star-shaped flowers disclosed by the unfolding of the handsome foliage, different shaped foliage than we have before seen in our walks? This is the Blood Root, *Sanguinaria Canadensis*. This native plant flourishes in light moist soil under deciduous trees and is excellent for massing in such a position.

This Early Saxifrage, *Saxifraga Virginensis*, is not a particularly beautiful flower, but it is a native and has in it the touch of Spring; it blooms freely in border, or rock-garden, in the sunshine in any soil.

Growing here in this rich border, though preferring a wet location in sun or half shade we see the Double Marsh Marigold, *Caltha palustris flore pleno*, with its broad double yellow flowers, a double form of our native plant *C. palustris*; its blooms are good for cutting.

The blooms of this plant before us have a very unique form; this is the Californian Columbine, *Aquilegia Californica* or *truncata*, bearing yellow tinted short spurred flowers. This plant flourishes in sunshine or half shade in a border of well drained sandy loam.

These two tuberous plants growing in this rock-garden are natives; they prefer a half shade and moist soil. These are the Spring Beauties, *Claytonia Virginica* and *Caroliniana* with their star-shaped pink veined flowers, the former the larger, borne in loose clusters on slender stems.

Four Anemones, *Anemone apennina*, with large white flowers, *A. pulsatilla*, with lilac colored flowers, and much divided leaves, *A. patens Nuttalliana* with star-shaped lilac flowers, and *A. ranunculoides*, with golden yellow flowers, sometimes semi-double, and with deeply cut foliage. All these Anemones thrive in the shade. *A. pulsatilla* is excellent for border or rock-garden; *A. ranunculoides* in rock-garden, and the other two in wild gardens.

As we are coming here we see some more bulbous plants in bloom. This is the Lily-like Fritillary, *Fritillaria liliacea* growing here in this border of rich loam. Its lily-like green veined or greenish flowers are sometimes solitary, sometimes several droop on their stalks.

These flowers of transparent white are those of the Sand Lily, *Leucocrinum montanum*; these stemless flowers with pale anthers and shaped like a funnel are fragrant, and continue to appear among the narrow leaves for several weeks; this is a good rock-garden plant.

These are the Summer and Spring Snowflakes, *Leucojum aestivum* and *L. vernum*, the former, we see, bears clusters of fragrant bell-shaped, green tipped flowers, somewhat like Snowdrops; the latter is a smaller plant with solitary flowers; both thrive in a border of rich soil.

In our garden walks and talks we have reached mid-April. What we see in our subsequent walks we will tell you in another issue of the CHRONICLE.

We are going to be called upon, nationally, collectively and individually, to renounce extravagance and learn anew the old lessons of thrift and providence. It will add to our power and emphasize our stability if we become a simple-living people once more.—W. G. Harding.

THE MASTER OF "THE MOORINGS"

In the death of Col. H. E. Converse, taken, as he was, in the prime of life, the horticultural world, the flower loving public and the pleasure seekers have met with a loss hard to estimate. Whether his beautiful estate, situated on Charles Neck in Marion, will be lost to the public is still a matter of conjecture. When Mr. Converse purchased this estate about 17 years ago it consisted of about 80 acres of practically undeveloped land and an old farmhouse. Today we find the whole place developed to such an extent that even the so called wild section is a thing of beauty, in fact so tastefully are the entire grounds arranged as to win the Hunnewell Triennial Premium for the most tastefully laid out estate in Massachusetts and also the silver medal of the Massachusetts Hort. Soc. for the best rose garden.

When the estate began to assume the desired effects he looked upon the work of the two master minds, and, deciding that it was good, he did not build a high wall with massive iron gates at the entrance or post a sign "No Admittance" but rather let it be known that all were welcome to enjoy the beautiful spot, embellished with the gardener's art, to the full without any restrictions so long as property rights did not suffer, in fact he even advertised in the papers when there was any special attraction. Col. Converse enjoyed his place but his chief pleasure was the enjoyment of his many visitors. Everything was open and the visitor wandered where he pleased, along the sea wall with its splendid view of Buzzards Bay, in the green-houses with their burden of fruit and flowers oftentimes in such abundance as to make one wonder at the profligacy of Nature when fostered by trained experts, through the daffodil walk in the Spring where the Golden Spur, Emperor, Empress and their ilk were nodding their golden heads and one felt he was in Fairy Land, through the Japanese garden and over the rustic bridge where one was constantly on the watch for a son of Nippon to appear so realistic was the scene, even through the mansion itself on certain days when he held open house. All these the Colonel enjoyed and took pleasure in the enjoyment of others. Some might say pride prompted the action, and it certainly would be a justifiable pride, but I would attribute it rather to a generous nature enhanced by a proper pride.

A very democratic man, everyone was welcome, the rich and the poor alike, and so open was the hospitality and so beautiful the picture, that hundreds walked the two miles each way from the electric. Even with the employees this democratic attitude prevailed to such an extent that the superintendent said "he seemed more like a partner than employer" while the same feeling existed among the help. All seemed to be working together, employer and employe, to make the place beautiful, cheerful and attractive. How well they succeeded anyone who has visited "The Moorings" will know. This was not his life work but it was a work remarkably well done and generously shared with his fellow man, something that will linger long in the memories of the present generation.

Col. Converse was much interested in Town affairs, gave it its fire apparatus and was very influential in procuring a water supply for its people.

The ultimate disposition of this beauty spot is still a matter of conjecture but it is sincerely hoped that it may still be saved in its charming simplicity and be continued as a spot where all may find pleasure.

Long live the memory of the Master of "The Moorings."
W. F. T.

Convey thy love to thy friends as an arrow to the mark, to stick there; not as a ball against the wall, to rebound back to thee.—*Quarles*.

Essentials to Success with Wild Gardens

HERBERT DURAND

WITH few exceptions, native shrubs, evergreens, ferns and wild flowers cannot be expected to thrive unless they are given conditions of soil, moisture and exposure closely similar to those of their natural haunts.

Some country places are fortunate in having suitable areas for establishing all, or nearly all, our indigenous plants. In such cases practically the only problem is to fit the plant to the locality.

Most home owners, however, have naturally congenial situations for only a limited number of plant families, and if other kinds are desired, as is almost invariably the case, the main problem becomes one of making the locality fit the plant.

To solve these two problems satisfactorily, it is necessary to know what plants are suitable for effective wild gardening, what each species requires in the way of nourishment and shelter, and what must be done to supply its needs artificially, if they do not exist naturally.

I believe the simplest way of teaching these fundamentals to the uninformed is by giving a list of the most beautiful, desirable and easily handled plants, divided into groups according to habitat, and with a concise description of the conditions under which the members of each group will ordinarily flourish, when properly planted.

GROUP 1. PLANTS GROWING NATURALLY IN MOIST SHADE.

Soil—rich, black, acid and light, largely leaf mold. Location—woods, ground sloping or well drained. Constant moisture from neighboring streams, or from springs. Conditions may be reproduced in any shaded area by adding leaf mold or commercial humus to the existing soil, seeing that the drainage is good and providing water when needed. A light mulch of dead leaves should be maintained. Avoid lime, manure and fertilizers.

Conifers—White Cedar (*Thuja occidentalis*); Hemlock (*Tsuga canadensis*); White Spruce (*Picea alba*); White Pine (*Pinus strobus*); American Yew (*Taxus canadensis*).

Broad-leaved Evergreens—*Andromeda (floribunda and polyfolia)*; *Leiophyllum*; *Leucothoe (Catesbaei)*; Mountain Laurel (*Kalmia latifolia*); *Pachysandra*; *Rhododendron (Maximum, Catawbiense, Carolinianum and punctatus)*.

Deciduous Shrubs—*Azalea (arborescens, calendulacea and vaseyi)*; Dogwoods (*Cornus florida, sericea and stolonifera*); Flowering Raspberry (*Rubus odoratus*); *Fiburnum (acerifolium, cassinioides and lentago)*.

Ferns—Maidenhair (*Adiantum pedatum*); Braun's Holly (*Aspidium aculeatum*, var. *Braunii*); Male Fern (*Aspidium Felix Mas*); Goldie's Fern (*Aspidium Goldianum*); New York Fern (*Aspidium Norzabracense*); Spiny Wood Fern (*Aspidium Spinulosum*, var. *dilatatum*); Narrow-leaved Spleenwort (*Asplenium angustifolium*); Silvery Spleenwort (*Asplenium thelypteroides*); The Bladder Ferns (*Cystopteris, bulbifera and fragilis*); Interrupted Fern (*Osmunda Claytoniana*); Broad Beach Fern (*Phegopteris hexagonoptera*); *Woodsia obtusa*.

Wild Flowers—The Baneberries (*Actea, alba and rubra*); Wood Anemone (*A. nemorosa*); Rue Anemone (*Anemone thalictrifolia*); Wild Ginger (*Asarum canadensis*); Pipsissewa (*Chimaphila maculata*); Prince's Pine (*Chimaphila umbellata*); Black Snakeroot (*Cimicifuga racemosa*); White Snakeroot (*Eupatorium ageratoides*); Bunchberry (*Cornus canadensis*); Crinkle Root (*Dentaria diphylla*); Dutchman's Breeches (*Dicentra cucullaria*); Shooting Star (*Dodecatheon meadia*); Trout Lily (*Erythronium Americanum*); Galax (*G. aphylla*); Liver-leaf (*Hepatica triloba*); Alum Root (*Heuchera Americana*); Crested Iris (*I. cristata*); Twin Leaf (*Jeffersonia diphylla*); Red Wood Lily (*Lilium philadelphicum*); Cardinal Flower (*Lobelia cardinalis*); Blue Bell (*Mertensia virginica*); Partridge Berry (*Mitchella repens*); Bishop's Cap (*Mitella diphylla*); Wild Blue Phlox (*P. divaricata*); May Apple (*Podophyllum peltatum*); Solomon's Seal (*Polygonatum biflorum*); Bloodroot (*Sanguinaria canadensis*); False Solomon's Seal (*Smilacena racemosa*); *Shortia (galacifolia)*; Foam Flower (*Tiarella cordifolia*); Wake Robin (*Trillium erectum*); Great White Trillium (*T. grandiflorum*); Jack-in-the-Pulpit (*Arifama diphylla*); Great Bellwort (*Utricularia grandiflora*); Virginian Speedwell (*Veronica virginica*); Canadian Violet (*V. canadensis*); Dog Violet (*V. canina*, var. *sylvestris*); Common Blue Violet (*V. cucullata*); Yellow Lady Slipper (*Cypripedium parviflorum*); Showy Lady Slipper (*Cypripedium spectabile*).

GROUP 2. PLANTS GROWING NATURALLY IN MOIST SUN.

Soil—rich and black, usually peaty. Location—low meadows, pastures, along streams and similar open places. Conditions may be approximated by adding muck or peat and supplying persistent moisture. Mulch plants until established.

Conifers—White Cedar and Hemlock.

Broad-leaved Evergreens—Sheep Laurel (*Kalmia angustifolia*); Pale Laurel (*K. glauca*); Leather Leaf (*Cassandra calyculata*).

Deciduous Shrubs—Shad Bush (*Amelanchier Canadensis*); Azalea (*A. viscosa*); Sweet Pepper Bush (*Clethra alnifolia*); Moosewood (*Dicra palustris*); Black Alder (*Ilex verticillata*); Sweet Gale (*Myrica Gale*); Chokeberry (*Pyrus arbutifolius*); *Rhodora*; High Bush Blueberry (*Vaccinium corymbosum*); Pussy Willow (*Salix discolor*).

Ferns—Marsh Shield Fern (*Aspidium thelypteris*); Lady Fern (*Asplenium filix-ferma*); Sensitive Fern (*Onoclea sensibilis*); Ostrich Fern (*Onoclea struthiopteris*); Royal Fern (*Osmunda regalis*); Cinnamon Fern (*Osmunda cinnamomea*); Narrow-leaved Chain Fern (*Woodwardia angustifolia*); Virginia Chain Fern (*W. virginica*).

Wild Flowers—Swamp Milkweed (*Asclepias incarnata*); Meadow Beauty (*Rhexia virginica*); New England Aster (*A. Nova-Anglia*); Turtle Head (*Chelone glabra*); Joe Pye Weed (*Eupatorium purpureum*); Golden Ragwort (*Senecio aureus*); Closed Gentian (*Gentiana Andreasi*); Sneezeweed (*Helenium autumnale*); Swamp Mallow (*Hibiscus moscheutos*); Quaker Ladies (*Houstonia carulea*); Blue Flag (*Iris versicolor*); Wild Strawberry (*Fragaria Americanum*); Meadow Lily (*L. Canadensis*); Turk's Cap Lily (*L. superbum*); Cardinal Flower (*Lobelia cardinalis*); Great Blue Lobelia (*L. syphilitica*); Purple Loose-Strife (*Lythrum roseum*); Bee Balm (*Monarda didyma*); Grass of Parnassus (*Parnassia Carolinianum*); Obedient Plant (*Physostegia virginica*); Meadow Rue (*Thalictrum cornuti*); Ironweed (*Vernonia Novboracensis*); Common Blue Violet (*Viola cucullata*); Yellow-fringed Orchis (*Habenaria ciliaris*); Purple-fringed Orchis (*Habenaria psychodes*); Smooth Wild Rose (*R. Blanda*); Pasture Rose (*R. lucida*).

GROUP 3. PLANTS GROWING NATURALLY IN DRY SHADE.

Soil—thin, rocky and usually impoverished by tree roots, except in pockets among the rocks, etc. Location—dry slopes and rock outcrops. Similar conditions may be improved by adding leaf mold where it is desired to install plants from Group 1, but in such cases moisture must be provided when needed. Without improvement the following plants will grow and do well in such situations:

Conifers—Common Juniper (*J. Communis* and *J. Communis procata*); Red Cedar (*Juniperus virginiana* and its varieties).

Deciduous Shrubs—Pink Azalea (*A. nudiflorum*); Sweet Fern (*Comptonia asplenifolia*); The Sumacs (*Rhus copallina* and *R. aromatic*); Dwarf Blueberry (*Vaccinium vacillans*); Dock-mackie (*Fiburnum acerifolium*); Yellow Root (*Xanthorrhiza apiifolia*).

Ferns—Christmas (*Aspidium acrostichoides*); Braun's Holly Fern (*Aspidium aculeatum*, var. *Braunii*); Evergreen wood Fern (*Aspidium marginale*); Ebony Spleenwort (*Asplenium ebeneum*); Hay-scented Fern (*Dicksonia punctilobula*); Polypody (*P. vulgare*); Bracken (*Pteris aquilina*); Rusty Woodsia (*W. ilicensis*).

Wild Flowers—Colic Root (*Alstris farinosa*); Wild Columbine (*Aquilegia Canadensis*); Sky Blue Aster (*A. laevis*); Blue Bells of Scotland (*Campanula rotundifolia*); Bristled Aster (*Diplopappus linariifolius*); Star Grass (*Hypoxis erecta*); Vernal Iris (*I. verna*); Creeping Charlie (*Lysimachia nummularia*); Violet Wood Sorrel (*Oxalis violacea*); Saxifrage (*S. aizoon* and *S. virginensis*); Rock Pink (*Silene Pennsylvanica*); The Sedums; Golden Rod (*Solidago caesia*); Purple Rue (*Thalictrum dioicum*).

GROUP 4. PLANTS GROWING NATURALLY IN DRY SUN.

Soil—usually poor, thin and sandy, or gravelly. Location—barren hills and rocks and other open uncultivated places. Diffi-

cult to improve conditions, owing to washing during heavy rains.

Conifers—Common Juniper (*J. Communis* and var. *prostrata*); Red Cedar (*Juniperus Virginiana* and varieties).

Broad-leaved Evergreens—Holly (*Ilex glabra*); Bearberry (*Arctostaphylos Uva-ursi*).

Deciduous Shrubs—Pink Azalea (*A. nudiflorum*); Bayberry (*Myrica cerifera*); Sweet Fern (*Comptonia asplenifolia*); The Sumacs (*Rhus aromatica*, *R. copallina*, *R. glabra* and *R. typhina*); Dwarf Blueberries (*Gaylussacia resinosa*, *Vaccinium Pennsylvanicum*).

Ferns—Hay-scented Fern (*Dicksonia punctilobula*); Rusty Woodsia (*W. ilicensis*); Bracken (*Pteris aquilina*).

Wild Flowers—Pink Yarrow (*Achillea millefolium*); Pearly Everlasting (*Antennaria margaritacea*); Sandwort (*Arenaria groenlandica*); Rock Pink (*Silene Pennsylvanica*); Heath Aster (*A. ericoides*); Bristled Aster (*Diplopappus linearifolius*); Wild Indigo (*Baptisia tinctoria*); Blue Bells of Scotland (*Campanula rotundifolia*); Golden Aster (*Chrysopsis mariana*); Flowering Spurge (*Euphorbia corollata*); Herb Robert (*Geranium Robertianum*); Kansas Gay Feather (*Liatris pycnostachya*); Button Snakeroot (*Liatris scariosa*); Orange Butterfly Weed (*Asclepias tuberosa*); Wild Lupin (*Lupinus perennis*); Moss Pink (*Phlox subulata* and varieties); Lovely Phlox (*P. amana*); The Sedums; Early Golden Rod (*Solidago nemoralis*); Showy Golden Rod (*Solidago spectabile*); Bird's-foot Violet (*F. pedata* and var. *Bicolor*).

Group 5, including aquatic and semi-aquatic plants and Group 6, comprised of general purpose plants, from all groups, which flourish under practically any conditions, will be the subject of an article in the March issue.

It will be noted that occasionally the same plant is listed under two or more groups. This indicates that the plant does equally well in different conditions and situations.

PEACH TREES ON WALLS IN MASSACHUSETTS 128 YEARS OLD

I WAS very much interested in the article in the last number of the GARDENER'S CHRONICLE on growing peach trees on walls at Montreuil near Paris. Peach trees have been grown on walls on this estate since 1793, nearly 128 years. They, however, have not been a decided success, owing, I think, to climatic conditions. I think from my observation around Boston, it would not be advisable to grow fruit trees closely trained to walls, unless one had some means of protecting them from late frosts. The strong sunshine in Spring, during the day, heats the walls enough to start growth, and very often the flower buds get destroyed, thereby ruining the crop for that season. I think if a wall effect of fruit trees is desired, the trellis should be at least eighteen inches forward from the wall (two feet would be better), thereby ensuring a free circulation of air between the tree and the wall. I have seen apples and pears tried on walls in this section, but never with any degree of success. We cannot follow European ideas in gardening too closely in this section of the United States. Boxwood was at one time largely used in the old gardens as an edging for walks, but the Winter of 1918 about entirely cleaned it out around here. We had a piece on this estate eighty years old, and that Winter about wiped it out, very much to the regret of the family.

I also note in the same CHRONICLE Mr. Vincent's article on the Dahlia, that he says there is a little lack of good commercial all round varieties. If he means good free flowering kinds, of good distinct colors, I agree with him, for one cannot go by what he sees on the exhibition tables. In days gone by we tried many of them, and found one could get only a very few perfect flowers per plant, the others being very imperfect. A race of good single Dahlias, of good distinct colors, would be very acceptable as cut flowers by many, as the others are not considered very artistic.

GEORGE F. STEWART,
The Vale, Waltham, Mass.

NEW YORK SPRING FLOWER SHOW

WITH four weeks intervening between the present and the opening date of the show, arrangements are wonderfully complete in all the main details. The big private estates are, this year, taking more than ordinary interest in the exhibition, and the group displays promise to be finer than at any previous show. Among those who are preparing extensive exhibits are: Payne Whitney, Manhasset, L. I.; Adolph Lewisohn, Ardsley, N. Y.; Daniel Guggenheim, Sands Point, L. I.; W. B. Thompson, Yonkers, N. Y., and Mrs. F. A. Constable, Tamaroneck, N. Y.

Entries for every one of the larger classes are in hand. There is always a doubt as to the possibility of filling a class as big, for instance, as Class 175, which calls for an exhibit showing the best development of a garden covering 1,000 sq. ft. The display may include lawns, flower beds, Rose gardens, shrubbery borders, Rose beds, bulb beds, or anything else an artistic exhibitor may suggest, keeping, of course, within the garden idea. Four entries have already been received for this class, and as competition is likely to be keen, some magnificent displays, such as never seen at any previous show, or, indeed, at any show in America, may be expected.

One or two novelty classes are featured this year. There is a class for "a bird bath, with a planting arrangement at base not to exceed 3 feet in diameter." This class, which is open to all, does not appear in the official final schedule. It is an extra, the prize for which is offered by the Garden Club of America. Another extra class is for window boxes; this also is an open class. A third extra feature is one, which, for want of a better name just now, may be called the "Backyard Garden." This display will be of the "before and after" character, showing conditions with and without a garden.

The classes for decorated tables are confined to private and amateur growers. This year, there is to be a competition on each day of the show excepting the last.

The "Tea Garden" will again be a leading feature, and in it various social functions have been planned to take place. This garden will be located at the Western end of the main floor.

With the tea garden location thus changed, a lot of very desirable space becomes available for trade exhibits on the second floor, Lexington avenue front. At previous shows, many would-be exhibitors have expressed desires for locations in this section of the building, which is easily approached and in many respects fully as desirable as some of the locations on the main floor.

The National Association of Gardeners has taken space on the main floor, which will be fitted as an office and conducted as the association's general headquarters during the show. The American Dahlia Society has taken quarters where Dahlia enthusiasts can gather; the Women's National Farm and Garden Association will similarly have quarters wherein to meet its members and friends. Those who have taken space in the trade exhibition are extremely optimistic as to the attendance at the show, the drastic changes made in the general layout of the exhibition being such as to insure something different from what has gone before.

The man is most original who can adapt from the greatest number of sources.—*Carlyle*.

There is a principle which is a bar against all information, which is proof against all argument, and which cannot fail to keep a man in everlasting ignorance. This principle is contempt prior to examination.—*Herbert Spencer*.

Plant Travelers

WILLARD N. CLUTE

THE casual observer finding the plants of field and wood rooted in the soil might hastily conclude that organisms so fixed in their places cannot move about, but a closer investigation should convince him that the reverse is true. Plants, to be sure, cannot move as rapidly as animals, but judged by their accomplishments they appear perfectly able to spread from one locality to another if given time enough. The dandelion has spread quite round the earth, a feat which few animal travelers have equalled though the English sparrow, the rat and the mouse make a pretty good showing.

In one important respect, however, the migrations of plants differ from those of animals. When the latter move into a locality the journey is accomplished by their own efforts and is directed by a certain amount of selective intelligence. Plants, on the contrary, have no choice as to the direction of their migrations and from the time the young plant, which we call a seed, leaves its parent, its movements are due entirely to chance. Moreover, the animal has a greater range of adaptability and is not so vitally affected by slight differences in its environment. In a measure it can modify its environment, but plants cannot. When they spread into distant regions it is by a series of trials, the outcome of which is decided by wild Nature.

Under the circumstances it is small wonder that plants produce so many more young than do animals. There are a number of species that in favorable circumstances may produce a million or more young, annually. No ordinary animal can equal that. When the young plant attempts to lay hold of the new region in which it finds itself, however, there begins a silent though deadly struggle with wind and weather, with birds, insects and fungous pests, with drouth and cold and with other plants, in which it must often go down to defeat. The necessity for the production of a large number of seedlings by plants if they would maintain their race is thus very apparent.

Though plants exercise no conscious efforts in reaching and holding new regions, they are often very elaborately equipped by their parents for success in such an undertaking. There is scarcely a seed or fruit that is not modified in some way for distribution. Those which come nearest to being without such aids are the tiny specimens, but their very size is in their favor and the friendly wind scatters them far and wide along with other animate and inanimate dust. In this method of distribution they follow the example of the mosses, ferns, and other flowerless plants whose exceedingly small and light spores are carried to immense distances. In one case recently recorded, fern spores have traveled on the wings of the wind for more than ten thousand miles; from the Himalayas, across the Pacific, to settle at last in Arizona. Though the seeds themselves may have no means of their own for distribution, the capsules in which they are borne often give them a good start, being so constructed as to shake out a few at a time when the wind is high, as in the case of the poppy and snapdragon. Then there are the various tumble-weeds which go rolling and bounding over the wastes shaking out the seeds as they go.

Since the wind works for nothing, a large number of seeds and fruits make use of it for transportation. One group trusts to parachute devices and sails upon the wind often for days, coming down when the wind dies out and resuming their travels when it rises again. The

winged seeds and fruits are rather more interesting since their modifications appear to have a measure of intelligence behind them. There are some of course, whose membranous outgrowths serve merely to catch the wind and thus drive them onward, but the majority have the wings so set that when severed from the plant they spin round like a propeller and thus delay for an appreciable interval, their descent to the earth during which they are wafted to a considerable distance.

Other currents besides the air may be used. The seeds of a number of water plants, as befits their station in life, are fitted with corky floats that make efficient life-preservers. Others that make use of the same medium for transportation put their trust in inflated chambers, like the water-tight compartments of modern ships. Thus equipped they may float for many days.

A very large number of wingless seeds have been able to acquire wings by the simple expedient of wrapping themselves up in substances that please the palates of the birds. Borne on feathery pinions they seldom fail to be carried long distances. The majority are enclosed in hard seed-coats so that if swallowed they escape digestion. Of somewhat more calculating dispositions appear those fruits with hooked appendages for laying hold of the clothing of passers-by, whether man or the other animals, and thus certainly, though often unwillingly, transported. To secure samples of these one has only to examine his clothing after passing through a weedy field in Autumn.

It is a noticeable fact that the hooked fruits are always borne near the ground where animals may come in contact with them, but that the winged fruits are usually found high on the plants so that when they release their hold on the parent, they have a considerable distance to go before reaching the ground. The juicy fruits beloved by birds may be borne at any height but it is interesting to note that nearly all are borne on woody plants.

It may be questioned whether the hard shells of nuts are adaptations for distribution or whether their hardness merely protects them from gnawing animals until they get started in life. In any event they are often distributed by small mammals who hide them away and often forget or fail to return to them. There are many ball-like fruits, the osage orange for example, that are distributed by simply rolling about on the ground or by being washed along by the floods of Winter and Spring. It is possible that the distribution of nuts is largely of this nature and the transportation by animals merely fortuitous.

Possibly half of the seeds with special means of distribution owe their dispersal to various forms of slings. In practically all of these the drying out of the tissues develops a tension that increases until with a sudden snap the seed-pod bursts, projecting the seeds in all directions. In some cases the seeds are thrown a thousand times their length. The sand-box tree of the Tropics is a classic example of such decrepitating capsules. The fruit of this species is nearly as large as one's fist and bursts with a loud report. The discus-shaped seeds, a little larger than a coat-button are admirably shaped to sail long distances.

The aids to the distribution of plants thus far mentioned all look toward the establishment of new individuals at long distances from the parent plant, but vegetation has other methods of peopling a region with plants, wherein an individual, once established, may start a col-

ony of its own. To such adaptations are often due the patches and clumps of plants to be found in undisturbed Nature. In contrast to the modifications already mentioned, these latter do not usually depend upon parts detached from the parent plant, but instead are, one might say, mere extensions of the original individual. A single strawberry plant in favorable situation will soon be surrounded by a colony of plants which are essentially parts of itself, produced by the familiar runners. A species of saxifrage is known as "Mother of thousands" from a similar method of multiplying.

The stems of plants most frequently take part in this vegetative multiplication and distribution of plants. The rhizome or rootstock is a typical example. Lying horizontally in the soil it increases in length at one end and as constantly dies at the other. By this process, in the course of a few years, though the original plant may still be in the locality, it is not in the same place. When such rhizomes branch, these latter soon become separated from it by the decay of the main stem and thus form the "fairy rings" most familiar in the case of certain fungi, but common in other forms of plants. Tubers are merely the enlarged tips of underground stems.

A typical bulb has very little about it to suggest a run-

ner or tuber but bulbous plants often indicate the connection. Some species, for instance, send out long underground runners which form bulbs at their tips. The adder's-tongue or *Erythronium* has this habit. There is also a great variety of above-ground stems that root at the tips as in the case of the black raspberry. The walking fern goes further and produces new plants where the tips of the leaves touch the earth. The *Bryophyllum* and some Begonias produce numerous new plants from the edges of the leaves and in our own region the common sundew multiplies in this way.

A number of plants, of which the cottonwood is a good example, cut off some of their twigs in Autumn in a manner similar to that in which the leaves are cast. These twigs, washed into suitable situations by the streams, may take root and grow. Some of the water plants improve on this by cutting off their tips gorged with food which sink to the bottom of the water and renew the plant the next season. Meanwhile, the plants, frozen in the ice usually die.

The little duckweeds, so common on the surface of quiet pools in Summer, always produce hibernacula of this kind, and though the smallest of flowering plants, rarely reproduce by means of seeds.

February Birds

PAUL B. RIIS

IT is ever darkest before dawn. The great frozen outdoors, Nature's own workshop, looks rifled and worn, its wintry monotony is palling the weary soul. The pure whiteness of snowflake and frozen crystals, the invigorating wintry air have lost the erstwhile charms of an old and refreshing acquaintanceship. The fortunes of Winter have been cast, the season stands out prominently on a grim and unyielding record. Now we are but merely waiting to check off its closing days, which perhaps, have spent their fury, and may grow mellow and repentant, softening at heart, and betraying within the generous soul of a masterful element. Inexplicable warm spells have closely followed on the heels of days of unusual severity. But severe Winters do not indicate warm Springs, any more than an early Spring should follow any early Winter. Extremes in seasonal changes follow invariably, but the regime of a severe Winter may be a long drawn out one, and long past due its regular and lawful term. Sometimes it happens that Nature's forces become disorganized and demoralized, until in some way they are again able to strike their equilibrium.

But to the Nature student, February is the crest of the wave, breaking in playful spray, setting again into motion the silent machinery of Nature's workshop. The true reawakening of life from the icy grip of death marks the early days of the month, the gradual waning of Winter and the gradual transition of death into life. A rosy dawn suffuses the white robe of purity of Mother Earth, bradling the returning circulation of the stream of life. The buds of the large toothed Aspen are swelling with the throb of renewed functions within, the red buds of Hawthorn have grown scarlet, showing vivid against the smoky outline of their stratified frames, The Elms and Maples, too, feel the reawakening from their slumber, their finely etched twigs showing dark and dense against the billowy outline of the snowclouds. The Junco, too, glad of the imperceptible change, twitters more happily. The tree sparrow we hear as Chapman says, "their chorus of merry tinkling notes like sparkling frost crystals turned to music."

How daintily the cedar waxwing or even the rarer

evening grosbeak pluck the red berries of the bittersweet, the bluejay extracting the meat of the acorn and the chickadee and the nuthatches relishing the seed from the upstanding stalks of wild hemp.

Horned larks and prairie horned larks are twittering in increasing numbers, and redpolls are gamboling about everywhere in loose flocks with the wing sweep and care-free note of the goldfinch. The great horned owl of the dismal swamp is again engaged in wooing his life's partner, and the big hawks, too, are pairing. But there are also newcomers, Spring birds and old friends, to arrive a little later, travelers from a sunnier and more generous clime, the early bluebirds. Stray fragments of their poetical strain may be heard from fence post and shrub-grown meadows any time after the twentieth and quite often, too, the happy carol of robin redbreast helps to belie the tardiness of departing Winter. Reluctantly we note the early arrival of the bluebirds, misguided by the approaching Spring in their Winter quarters, but they come to us to soften the lingering departure of King Boreas. They appear like messengers of hope, pouring out their faith in their incomparable warble, the joyous and gladsome notes of a generous victor, pleading with us to be patient but yet a little while. Their arrival has also been prompted by the reawakening of life within, the kindling of the mating instinct to come north to their breeding grounds, homes which once held their cradles.

With the return of the season of life, the arrival of birds, the gradual swelling and unfolding of buds, there are revealed to us other mysteries of life, each one more wonderful than the other, passing by in a never ending succession of kaleidoscopic splendor. The simple gifts of late Winter are rarer and more precious to us than the lavish offerings of May and June, they constitute the offerings of a convalescent, gathering strength and volume with the return of the awakening rays of Spring sunshine. They gladden the heart with their sheer simplicity, in wonderful contrast to the harsh and cruel dominance of boreas. They are gifts of compassion, of a sympathetic spirit, a compensation for the weeks of yearning to a longing soul.

The Greenhouse, Month to Month

W. R. FOWKES

THE days of February and early March are busier than those of last month. Extra sunshine calls for more attention to the checking of the fires early in the day, and some plants will need a light shade. The orchids must have a thin coat of white paint on the glass by February 20th, and palms and ferns must be protected also. It is a period of great strain on these plants when the wind blows strong and the ventilators are down to keep out the cold draught, or in case of a tall structure, to keep the roof intact.

The somewhat mild Winter we have been enjoying has brought the nectarines along more quickly than ever, and the early varieties are in bloom. Take care that they are never dry at the roots, but have a dry atmosphere. Go over each blossom lightly with a rabbit's tail tied to a stake to pollinate the blossoms. The proper time is now when the pollen is dry. Do not ruin these plants with heat, for they must be kept quiet, and do not allow the temperature to rise above 50° at night. This is the great secret. I have seen failures occur where a night fireman was employed, though due care was exercised in the day because the fireman, who was not posted and looked after occasionally, thought as long as the roof did not fall in, that all was well. After the bloom is set, careful syringing should be employed.

Carnation cuttings should all be in the sand, and also the larger varieties of 'Mums.

Primulas will succeed nicely with the nectarines and only need careful watering and a feed of Clay's every ten days.

Gardenia Veitchii is now at its flowering stage. We have some in six inch pots, cut back; that is, young, vigorous plants headed back last September and kept fairly cool. Now the sunlight is assisting them greatly and the main thing is to prevent the buds from dropping. I find occasionally that if they have been syringed rather heavily and not dried off before night, a few promising buds fall off. Therefore, it is advisable to keep them dry overhead in the early afternoon. See that the drainage is clear and drive the worms out of the pots. Soot water once a week is the best stimulant for them.

Now is the time to repot the ferns, using light soil. It is important that the pots are properly drained. *Adiantum Farleyense* needs heavy soil, no peat, no leaf-soil, and not the high temperature it is often forced to undergo.

The roses require a little care. The twiggy basal wood, known as the mother plant, must be cut out clean. Get daylight into the bushes. This twiggy growth will not give a single rose bud for the space it occupies, but is a fine home for the red spider, and the continual dropping of the leaves from this source is a daily nuisance. Prune back any strong wood that may have been left about two feet long when cut in a hurry. If they are cut back to two eyes, you will have a splendid crop for Easter cutting. Let the feeding alone for two weeks, and throw in a handful of air slaked lime into each bush. If angleworms are troublesome, give the benches a good watering and fumigate the same night with Nicofume paper. The dead worms will be found next morning on the top and sides of the benches by the score.

The gloxinia bulbs started in the flats last month should be potted. These plants like leafsoil. The first

potting should be done with care. Place them in a warm corner with a temperature of 60° at night and in a semi-shaded position during the day.

The Azaleas are to be looked after for Easter and should be in a light position. Do not allow them to become too dry or too wet, or infested with worms. It will prove fatal to them.

Camellias will not open their buds if kept warm. You can force the azaleas with heat when you want them to bloom, but camellias will cast their buds with heat. Both can be grown together otherwise, bearing in mind the different requirements.

Hyacinths, the show varieties, should be fed well and not overforced. Tulips can be forced at this time, the Darwins being the best for this season of the year.

Crotons should be propagated now. Take any bushy plant that you choose and make an upward incision about an inch from the stem. Insert a tooth pick to keep open the cut and fill with a little moss and sand. Tie firmly with raffia. A boy can do a lot in a few hours if his fingers are nimble.

Sponge all palms. Do not sour the soil they are growing in by watering with soap suds. Use soot water. These plants should be given any repotting they may need, but do not over-pot. It is better to feed.

Cucumber Telegraph, which was started some time ago and is now a five-inch plant, should be set in a warm corner in a large tub or pot about twelve inches. One plant will give as many cucumbers as a small place requires until outdoor ones are ready. Use broken turfs and lumps of half decayed cow manure. Tie the plant to a stake and let it reach the top of the trellis, or four feet. Then pinch out the point; laterals will push out and the first young cucumbers must be rubbed out and the plant will soon be strong enough to bear a nice lot of useful fruits.

Tomato plants which were started in December should be in eight-inch pots and about two feet high. Do not over-water and pollinate the blossoms at noon. Keep all side shoots rubbed off; grow to a single stem, and do not feed until the fruits are of a fair size.

OUR COVER ILLUSTRATION

The illustration on our front cover, reproduced from a photo, through courtesy of John Scheepers, Inc., shows the entrance to the gardens at "Daybreak," the beautiful estate of Supreme Court Justice Josiah T. Marean. Here the Judge shows how advantageously he can use his wonderful Dahlia Creations together with the full range of other ornamental plants. In 1915 the Judge exhibited his Creations for the first time; the American Dahlia Society ruled him out of competition for the reason that his Dahlias were exhibited only under number. In 1916, having named his seedlings, they were awarded First Prize in the class for 50; the only exhibit he then made. In 1917 and 1918 he exhibited in the 50 and also in the 25 and 12 classes, winning both years First Prize in all classes. In 1919 he received First Prize in the 50 and 25 classes; also First Prize for the Largest Flower in the Show, First Prize for the most meritorious display in the Show, besides other minor First Prizes. In 1920, desiring to only exhibit out of competition, his exhibit was awarded a Special Gold Medal.

Consider the Gardener

What He Should Be and What He Often Is—His Rightful Relations to His Work and Employer

ELLEN P. CUNNINGHAM in House and Garden

IN America today, unless the gardens are of the intimate form and size in which many of our colonial ancestors and later such enthusiasts as Celia Thaxter joyed to labor, the ubiquitous pest of which not even a quarantine ruling of the Federal Board of Horticulture can rid our Edens is the labor problem. Gardens may have to be simplified, if they are too large for the sole care of the owner, because a wealth of literature and visits to perfected old-world gardens have stimulated taste beyond the physical power to apply it. How can we escape the wilderness unless more skilled gardeners come to the rescue?

Whatever the nationality of workers at present listed on the family tree as gardeners, they may apparently be anyone shouldering a shovel as a symbol. The dictionary justifies this classification, for it defines "to garden" as not only "to lay out, to prepare, to cultivate land as a garden, to practice horticulture," but "to labor in a garden." So "gardener" is interpreted in various human forms.

We have found that a gardener may be an untrained day laborer who ignorantly follows or fails to follow directions as he pleases, possibly weeding out even rose bushes without prick of thorn or conscience and hoeing up the precious self-sown seeds. He may be a sporadic worker—perhaps a Norwegian sailing-master, driven to shore tasks by the sinking of so many of his country's ships during the war, and who climbs down from a painter's ladder patiently to extract miniature bulbs from the sod where they have become naturalized. Or there is the odd-job man who with a little general knowledge and experience contracts to care for a place by the season, but who takes no special interest in any particular one, as his attention is distracted by the claims of other places.

Then we have the resident handy man who serves as bathing master in the Summer and caretaker in the Winter, working in the gardening incompletely—for when some flowers are missed from the beds, they are found lying indoors in their original packets. . . . Finally, there is the chauffeur gardener, who is likely to be called at any moment from the intricacies of mechanics to those of horticulture. Fortunate are the flowers if he is country-bred, and to be pitied if he has been raised in the city.

In some places the old family gardener still exists, perhaps too illiterate to read or properly pronounce the names of the flowers with which he works such wonders, and skeptical of everything in print, declaring that you can put anything in books but not in gardens—if he can help it! He respects only bought or home-grown plants, ruthlessly destroying, no matter how beautiful they are, all native vegetation which he calls wild, saying self-righteously that he is "a poor hand to save weeds." Seldom visiting flower shows to absorb new ideas, he sees no necessity for replacing old plants and shrubs with improved new varieties. He has never heard of color schemes, yet by familiarity with local soil, climate and the family taste he is enabled to produce satisfactory results of a certain kind, and he is so devoted to his flowers that he will spend portions of even Sundays transplanting

tiny seedlings with his pen-knife. Surely such a man can say "I count not hours by dollars, but with flowers." To this class of gardeners we owe a lasting debt of appreciation for faithful service to the best of their ability. They toiled early and late, in heat and cold, rejoicing in the pleasure of the family as much as in the beloved flowers.

Our large estates are especially indebted to the scientifically trained private gardeners who have come from England, Scotland, Denmark, Germany, etc., where a man aspiring to become a superintendent is expected to serve years of apprenticeship before assuming the larger responsibilities.

Why are intelligent, trained private gardeners so scarce? Mr. William N. Craig, President of the National Association of Gardeners, offers several answers. First, that the war has depleted the ranks of gardeners, as of other professions. Second, that salaries for superintendents have not risen proportionately to pay for less skilled workers, and many expert men have gone into more lucrative occupations. Third, it is increasingly difficult to recruit the ranks of gardeners from American boys who are unwilling to give so many years to preparing themselves professionally.

Evidently, if high standards of gardening are to be maintained, more of our young people must be interested in scientifically training themselves as horticulturists and as managers of large and small estates. Nature study classes and school gardens are awakening special powers of observation and emphasizing the practical value of patience and diligent perseverance. As the minds of the boys and girls expand, let us further open their eyes to the joyous possibilities of self-expression of outdoor life, before youth is stifled in the commercial confines of the city where, amid the ever-increasing roar of industry, the call of the country is heard too late. Public and private enterprise must combine to throw searchlights on the path to be chosen, revealing the mysteries of science as related to horticulture. Even soil, when discoursed upon by such a man as Professor Button of the Farmingdale, L. I., State School of Agriculture teems with history, science, poetry and religion, as he explains how destinies of nations depend upon the character of their soil, and how, by altering it scientifically, the trend of civilization is changed. Furthermore, poetry and religion draw their inspiration from the beauty of bloom issuing from the soil.

Once the desire to study gardening is created, how is it to be gratified? Glimpses at home and abroad show some of the methods of training gardeners. In Europe there are special schools. In England alone, last Summer, Miss Elizabeth Leighton Lee, Director of the School of Horticulture for Women at Ambler, Pa., visited a dozen of the many schools for women in Great Britain. On the Continent, familiarity with three modern languages is sometimes required, and a health certificate, as conditions of admission to classes, thus hinting at the high standards for gardeners.

In this country, in addition to the public opportunities offered by colleges and botanic gardens, the gar-

den clubs are not only educating thousands of their members in practical planting of public and private grounds, but, like the Woman's National Farm and Garden Association, are giving scholarships for the training of women gardeners. For two Summers a new departure has been successfully made by Mrs. James Duane Livingston, who opened her place, "Garden Home," at Barnstable, Mass., to young women coming from such elaborate homes that the multiplicity of gardeners and domestics prevents the future mistresses of estates from learning gardening and household management.

Another opportunity for training is offered by Mrs. Samuel T. Bodine of Villa Nova, Pa., whose extensive estate and eminent superintendent-gardener, Mr. Alexander McLeod, have formed an exceptional combination. Young girls are received here for practice and instruction, are partially paid while learning, and have model housing accommodations. Mr. C. T. Crane's estate, at Ipswich, Mass., has also employed young women under the superintendent-gardener, Mr. Cameron. An October conference at the Massachusetts College of Agriculture is said to mark a new epoch in the advance of women in agriculture and horticulture. Boys have worked during the Summer under Mr. Craig, superintendent for Mrs. Edward Brandigee's Faulkner Farm, Brookline, Mass., and Mr. Untermyer and Mr. Dupont have agreed to receive groups of boys on their places.

Should there be any question of adequate pecuniary reward if gardeners are properly qualified? Certainly in few other professions is the laborer more worthy of his hire. America cannot, any better than an individual can, live by bread alone, and never has there been greater need of the spiritual refreshment coming from the beauty of gardens which depend so much upon the persons caring for them. In spite of this, Miss Ellen Eddy Shaw, head of an educational department of the Brooklyn Botanic Gardens, states that the most frequent question she receives is "How little can a woman be secured for?" Not "How much should be paid for the best woman?" She believes the profession of gardening owes itself suitable standards of salaries to ensure the respect of the public, as well as to protect the workers from the deadening economic pressure of under-pay. Furthermore, it would not be justifiable to persuade intelligent persons to enter a profession which would not furnish a living wage. Here, it seems, is a case for educating the public to pay for value received, even though the artist of the out-of-doors as well as the in-door fields of literature, etc., receives a compensation in happiness which is all his own, and may think first of the work and last of the reward. Improvements in housing and recreations may be counted on as additional inducements for the right persons to take up gardening and apply trained intelligence to it.

Finally, however, after the last word has been said on education and salaries, the most delicate and difficult part of the problem remains—the adjustment of temperament and point of view, the human relationships. No matter how well laid out or flourishing horticulturally our land may be, it will be impossible to achieve our heart's desire, the perfect garden, unless there is harmony between employer and employee. For instance, a certain owner wearied of the ceaseless laments of her gardener, inconsolable for the frost-blighting of his Weigela hedge, the glory of whose bloom illuminated a large part of his calendar. Then, suddenly, she became sympathetic as she realized that, much as she loved her beds and borders, her

disappointments found distraction in travel over the entire globe, while the gardener's joys and sorrows were intensified within his hedge-hemmed world.

The cloven hoof of avarice occasionally leaves its prints in a paradise, as when some artistic woman's soul is starved and skimmed for flowers for which her well paid gardener ever insists there is neither time nor fertilizer, while vegetables are raised far in excess of the family needs, the surplus going to over-fed employees. Another owner despairs of having her favorite flowers, which her gardener insists are not adapted to the soil which, nevertheless, can grow all his favorite specialties for exhibitions. On the other hand, an example of extremely friendly relations is afforded by a gardener who walks miles, in his spare time on Sundays, to aid in labor beyond the physical strength of a former employer whom change of circumstances had forced to let this man seek another place. He refused all pay for his generous services, threatening never to return if money were mentioned!

Mutual consideration is the true touchstone, and Mr. Walter Wright, the English author and Kent County-Council gardener, intimates that co-operation in plans from the beginning will go far toward their success, as the gardener is then more interested in assuming responsibilities with his employer. So many problems occur, requiring both points of view, that it may be worth while occasionally to hold forums for employers and gardeners, where on a platform of knowledge, taste and sympathy, discussion will promote complete understanding, without which we can never attain the true definition of a garden—"a delightful spot."—*This article is reproduced in these columns through the courtesy of House & Garden.*

HARDY CYCLAMENS

The various species and varieties of hardy Cyclamens are among the choicest and most beautiful of hardy plants. Their cultivation is not difficult, a free open soil, mixed with leaf-mould, suiting them admirably. They may be grown among short grass or under trees or shrubs. About the rock garden in almost any position they are quite happy, and the freest growers soon make large clumps. Some produce the flowers before the leaves, others produce flowers and leaves together.

Propagation is best effected by seeds, which in some cases are freely produced. *C. africanum*, *C. repandum* and *C. neapolitanum* usually seed freely; these, if sown as soon as ripe, germinate in a fortnight or so, and as soon as the seed-leaf is well developed they may be picked off into boxes, two or three inches apart, where they may remain until the following year, when the corms will be sufficiently developed to plant out.

The production of one seed-leaf only has been the subject of inquiry by numerous botanists, the latest being the Assistant Director at Kew.

In a paper read recently before the Linnean Society Major Hill showed conclusively that two seed-leaves are really formed in the embryo as in dicotyledons generally, but that one of them becomes aborted and never develops.

When planting the corms the soil must be well broken up and mixed with leaf-mould and sand; in some heavy soils devoid of lime, old pulverized mortar rubble is an advantage. The corms should be planted just below the surface and covered at first with leaf-mould and sand. The planting season varies for the different species; those that flower in Autumn must be planted when dormant in Summer and those flowering in early Spring may be planted in early Autumn.—*Irish Gardening.*

A Lesson on Plant Physiology and the Plant in Relation to Its Environment

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

THE germination of seeds is a very wonderful phenomenon to watch, and by doing so some interesting facts may be observed. Viable seeds will germinate on the surface of well moistened soil or sand if we provide a damp atmosphere above them by covering with a glass bell-jar or something similar, as light does not hinder germination.

After germination has commenced the seed-case is of no further use. It has fulfilled its purpose, which is to protect the seed from the time of its maturity until conditions arrive suitable for germination; henceforth it is a hindrance to germination in many plants as it must be torn asunder by the expanding plantlet. If we watch the germination of a squash or similar seed through the different stages we can discover that Nature has made a special provision to help the plantlet in escaping from the seed-case. The first shoot from the germinating seed is called the hypocotyl, which first grows downward no matter in what position the seed is placed. It will curve in a semicircle if necessary in order to bring its rounded point into the soil. Strictly speaking, the hypocotyl is that portion of the stem or axis which is situated below the cotyledons of the embryo and which is above the root. As the hypocotyl grows downward, a projection or hook is formed on the side towards the seed; this hook holds the seed-case down while the seed-leaves (cotyledons), are pulled out from it. Sometimes the point of the seed-case breaks, thus permitting the hook to slip off; also, if the seed happens to be planted edgewise, or with the point downward, the hook often fails to catch the seed-case, and therefore the plantlet emerges from the soil without freeing itself from the seed-case and is for a time hampered. This provision is peculiar to the pumpkin family, to which squash, melons and cucumbers belong, although other provisions accomplishing the same end are found in a few other families; many plants are, however, considerably held back by the seed-case during germination. Seeds of the pumpkin family should be planted flatwise rather than edge, or endwise, since in this position they most readily free themselves from their seed-cases. Lima beans are best planted edgewise with the concave side downward.

The best depth at which to plant seeds of different species varies in a general way with their size, and the rule sometimes given is that seeds should be covered with a thickness of soil equal to four times their diameter. As above mentioned, the first shoot from the seed called the hypocotyl, grows downward, but if the seed is sufficiently covered, the point of the hypocotyl is not always able to penetrate into the soil because the resistance offered by the latter is not only often greater than the pressure offered by the weight of the seed, but, what appears to be in this connection more important, the larger the seed the larger is the hypocotyl, and it obviously requires more force to push a large root into the soil than it does a small one; therefore a large seed requires the additional weight of a thicker covering of soil so as to afford sufficient additional leverage to enable the root to grow downwards, otherwise the germinating embryo would be entirely lifted out and from lack of moisture be unable to complete the act of germination. It must, however, be admitted that this latter event is only likely to happen under conditions of bad soil preparation so that the ground under the seed is hard and lumpy.

The rule that the depth of planting is governed by the size of the seed is, like most other rules, subject to exceptions, which exceptions are connected with the special mode of germination practised by different seeds. If we take a pea or a bean and soak them in water so that the seed-case can be easily removed, we shall find that they divide almost of themselves into halves joined together at one point, and at the point of junction the embryo can be easily seen. These two parts of a seed are known as cotyledons.

Plants having two cotyledons form the very important class known in botany as Dicotyledons; while those known as Monocotyledons have but one cotyledon. There is also a class, which includes conifers, in which the members have several cotyledons.

In some cases the cotyledons remain in the soil, and in others they are lifted bodily into the air in the act of germination; it is this distinction which has to be considered when covering large seeds like the pea, bean, pumpkin, etc. In the case of the pea,

the cotyledons remain in the soil, and this species will germinate from a depth of five or six inches as it is only the pointed shoot which has to be forced through the covering soil. But with beans, pumpkins, and many others whose cotyledons must reach the upper air before germination can be completed, it obviously requires considerably greater force to push the more or less broad cotyledons through the soil than it does a mere pointed shoot. Therefore if seeds like beans, etc., are covered too deeply the hypocotyl is often unable to lift the cotyledons to the surface and the plantlet perishes. Frequently, too, the energy used by the hypocotyl is sufficient to break off the cotyledons and the plantlet emerges minus these appendages, in which case also it dies. Seeds of the larger beans usually fail if covered to a depth of three inches, especially if the soil is clayey, while those of the Castor Bean, though very robust, can hardly lift their cotyledons through one inch of soil. Wheat, corn, and other similar monocotyledons, will germinate through five inches of soil as their tiny, pointed shoots readily insinuate themselves between the soil particles and come to the surface with comparatively little expenditure of energy; it is not, however, necessary nor advisable to plant them so deeply.

As a rule the earlier germinations from a sowing of seed produce more vigorous plants than later ones. This is sometimes looked upon as one of Nature's methods for preserving the vigor of species, as the stronger seedlings overtop the weaker ones and crowd them out of existence. This should be remembered when transplanting from a seed-bed and we should therefore reject if possible plants from the later germinations. In all cases the covering of soil over seeds should not be deeper than is absolutely necessary because it is advisable to secure the completion of germination in the shortest time possible. As previously mentioned, when a plantlet has used up the food supply in the seed before germination is complete, it is liable to die, and in any case it is likely to be weakened if it has to grow through an excessive thickness of soil, even if it is possible for this to take place. In respect to peas, for instance, while they will germinate through five or six inches of soil covering, it is not advisable to cover them to that depth in spite of the fact that it is necessary to have the roots of peas as deeply placed in the ground as possible for the purpose of keeping the roots away from the (to them) deleterious effects of hot weather. The latter is sometimes secured by mulching, but a good method is to sow peas at the bottom of a trench six inches deep and cover them with two inches of soil; then gradually fill in the trench as the peas grow. In all cases seeds may be covered about a fourth deeper in a sandy soil than in a clayey one.

Very small seeds, celery, petunia, begonia, and such like, should be scarcely covered at all. When seeds of this character are sown in pots or flats under artificial conditions, such as the window of a room, in a greenhouse or frame, it is best to merely press them into the surface of the soil and cover with a sheet of glass to prevent evaporation, or they may be shaded with paper or muslin. The soil should be moist before sowing, and if further moisture is required before germination takes place watering should be done with a very fine sprinkler, a better plan is to place the pot or flat in a vessel of water, taking care that the water is not deep enough to reach higher than one inch below the surface of the soil. In all cases overhead watering of seeds should be avoided if possible, as this operation is liable to puddle the surface of the soil; if care is taken that the soil is thoroughly moist before sowing it is rarely that watering is required until after germination.

Shading which has been placed over seeds should be removed as soon as they germinate, and in rooms and greenhouses, pots or flats of seedlings should have all the light possible and be placed close to the glass, so as to prevent the young plants from becoming drawn and spindly; strong plants can never be produced from seedlings of this character.

It has been indicated that rapidity of germination is in all cases desirable, and this is naturally more easily accomplished in a warm soil than in a cold one. While in the case of things like melons, lima beans, and others native of hot climates, it is useless to sow them until the soil is warm, the general rule for harder species like peas, spinach, and so on, is to sow them as

early as possible in the Spring, as soon as the ground becomes workable, so that they may become established before the advent of hot weather. The natural environment of these latter causes them to be constitutionally adapted to germinate at a temperature just above freezing point, and they will germinate as quickly at a temperature of 35 deg. F. as melons, etc., will at 65 deg. F.

Thoroughly drained soils, deeply cultivated and well pulverized, not only warm up quicker after frost is out, but they come into a fit state for sowing seed much sooner, and plants will grow quicker on them, than is the case in connection with ground which has had poor treatment. Autumn spading or plowing is an important fundamental in obtaining the best soil conditions in the Spring.

Germination is liable to be prevented by seeds being sown in contact with compound chemical fertilizers, acid phosphate, or any other inorganic fertilizer containing acid. The chief injury by chemical fertilizers in connection with germination appears to be inflicted upon the embryo after germination has started rather than upon the seed itself. Organic fertilizers such as stock yard manures and ground bones do no harm either to the seed or to the sprouting plantlet. Dissolved bones are liable to inflict injury because they are dissolved by acid.

The operation of sowing seed should not be carried on when the soil is wet or sticky, as treading upon, or working a soil in that state always does harm as a condition is brought about which excludes oxygen, and which will also cause it to dry into hard lumps.

Very soon after germination is under way the embryo is seen to be practically divided into two parts, namely, an ascending and a descending axis. Of the two extremes of these axes the ascending one becomes the shoot or plumule, and the other the root or radicle. The question will at once arise as to what causes the shoot to grow upwards and the root downwards? To this question there is no real answer, except to say that the cause is unknown. Certain guesses have been from time to time made as to the why of this characteristic in plant life, one of these being that the growing of the radicle into the soil is brought about by the action of gravity, or, as it is sometimes put, by the exceeding sensitiveness of the tip of the radicle to surrounding influences especially to gravitation, a condition to which the name geotropism has been given, the root being said to be positively-geotropic and the shoot negatively-geotropic. While there is no plant organ more wonderful than the tip of the radicle and there is no doubt about its extreme sensitiveness, equally as much may be said as regards the shoot. Darwin wrote: "It is hardly an exaggeration to say that the tip of the radicle, endowed as it is with such diverse kinds of sensitiveness, acts like the brain of animals." He could have said the same thing about the shoot. It seems that Darwin's line of thought opens up more possibilities tending to solve the problem as to why the root grows down and the shoot up, than anything else. While the existence of brain-power in plants may not be capable of actual scientific proof, yet there are hundreds of facts connected with plant life which give ample grounds for faith to believe that such power exists.

It certainly appears to be nothing but absurd to bring the attraction of the force of gravitation into the question, for the simple reason that this force acts equally upon all matter of the same weight existing under the same conditions, and it would therefore have the same pull upon the shoot as upon the root. Another point is that different species have different methods of root-growth, some have a tap-root which while growing down very deeply into the soil when conditions render this possible, also produces horizontal roots; others, after the first root has gone down some way, grow their roots entirely in an horizontal manner. Then again when the soil down to, or below, the roots has become very dry, and which subsequently is watered so that only a couple of inches or so is kept moist, the roots will turn and grow upward for the purpose of reaching the moist soil and obtaining the water the plant stands in such great need of. In this action brain-power appears more in evidence than the force of gravity. It is this characteristic of plants' roots growing towards the surface when the latter is moister than the soil below, which is why mere surface sprinkling does more harm than good when artificial watering is practised. In watering plants sufficient should be given at one time to soak the soil to the bottom of the roots. In this way, coupled with cultivation when the surface has become dry enough, watering is not required at one spot more often than once a week in dry weather.

While therefore the reasons why in the germination of seeds the shoot and the root will curve round in their efforts to grow up and down respectively is unknown, the greatest success from growing plants from seed is obtained by the grower first making the environment in which the seed is placed of such character that these movements are carried on as easily as can be so that the final completion of the act of germination is accomplished as quickly, and with as little expenditure of energy as possible.

With the establishment of roots in the soil and with the

exposure of green leaves to light and air, germination is over and the plant is able to gather and work up its own food from outside. The next step is to consider how it obtains food and assimilates it for its growth.

In connection with out-of-door gardening, the cultivator has the part of the plant's environment which lies beneath the soil surface more under control than the part which lies above it. Practically he can do nothing by way of changing the composition or temperature of the air or of the amount of sunlight, but he can do a great deal in influencing and improving the fertility, the mechanical condition, the drainage, and the aeration of the soil; all of these combined constitute the environment of the roots. It is therefore of considerable importance to know something about the roots of plants as well as of the soil in which they grow and collect the plant's food. Obviously the plant is extremely dependent upon its surroundings or environment, the more so because of its lack of the power of locomotion. Therefore plant organs must establish certain definite relations with things outside of themselves before they can work effectually; and these necessary relations are called life-relations. For example, green leaves are definitely related to light as they cannot perform their peculiar work without it; most roots must be related to the soil; certain plants known as aquatics are related to abundant water; some plants, such as parasites, are related to other plants. Each organ, therefore, must become adjusted to a complete set of relations. Three conspicuous organs, root, stem and leaf, are concerned with nutrition and growth, and most plants have at some period of their life another structure, the flower, which is entirely concerned with reproduction.

The roots of land plants serve to anchor the plant in the soil enabling the stem or stems of erect species to grow upright, and to supply the plant with water containing its dissolved food materials. As above mentioned, the primary root develops from the lower end of the hypocotyl; but not only do lateral roots develop from this primary root, but they may also develop freely from other parts of the stem. If the base of the stem of a corn plant be examined a week or so after germination we may see roots growing out from above the point at which the stem was originally attached to the seed; and if we pull up a squash vine, or unstaked tomato plant, or others of similar growth late in the Summer, we often find them rooted from the stem at some distance from the original root. Lateral roots originate in the internal tissues of the root or stem, and not close to the surface as do buds.

Most forms of roots are adapted for growing in the soil, but there are some of which this is not true. Thus many orchids and ferns have aerial roots which fasten the plants to the stem or branch of a tree, and absorb moisture and food from the heavy humid atmosphere of the forest; other roots are what are called adventitious, or accidental, like those of ivy, which enable the plant to cling to the stem of, and climb up another plant; also to cling and climb up a wall, etc. It is noteworthy that these adventitious roots are not usually put forth until after the ivy shoot is in place against the object it proposes to cling to. There are also roots which are parasitic, like those of the mistletoe and dodder, which enter into the tissue of their host plant—which aerial roots and ivy and orchids do not—and draw nutriment from it. Another somewhat extensive group of roots are those of aquatic plants, which are adapted to life in the water.

In the case of all land plants the growing tip of each root is protected by a cap of cells called the root-cap. This root-cap consists of several layers of cells, the outer ones gradually dying or being worn away as the tip of the root pushes through the soil, and being replaced by new layers of cells which are continually growing beneath. The mass of cells forming the root-tip is always resistant and compactly arranged within; but as the cells are pushed outward, becoming old, and sloughed off by the continual addition of new cells, they undergo gelatinization and decay; this gelatinization is important as it no doubt acts as a constant lubricant to make easier the course of the tip as it progresses through the soil.

In advancing through the soil the root-tip does not move in a straight line but has an oscillating motion which enables it to take advantage of openings between the soil particles. Since the soil offers more or less resistance to the growth of roots, it is evident that the roots of plants growing in it cannot elongate through their whole length at once. If we try to push a piece of fine wire, say a foot long, into the lightest soil, holding it at the end away from the soil, it will be found to be impossible on account of the wire bending. As a matter of fact the "push" which is needed to force the root forward in the soil is confined to a portion rarely more than a half an inch in length.

The roots and minute rootlets which, in a complete root-system are readily evident to the eye, are, however, secondary with respect to the relations which exist between the plant, the soil, and the air and moisture the latter contain. When a plant's root-system is examined, organs smaller than the fine rootlets are

not generally noticed. There are, nevertheless, minute and effective structures invariably present in great abundance, known as root-hairs, which arise from the surface of all young and growing roots. As soon as the root in germination has attained to the length of about an inch these root-hairs are developed at a short distance behind the root-tip. They arise practically perpendicular to the surface, and an examination under a microscope indicates that they are simple, elongated cells, consisting of a rather resistant cell-wall within which is contained granular protoplasm and cell-sap. Root-hairs may become very evident if we artificially germinate seeds, of radish for instance, between sheets of moist filter-paper or flannel, and when grown in this way the hairs assume generally a greater length than in the soil, and they are, as well, perfectly straight tubes. As they develop in the soil, however, where the numerous particles of earth obstruct their growth they bend about and flatten out against and around these particles, becoming as a result contorted and deformed in appearance. It is evident that they come into the most intimate contact with the minute grains of soil, so much so that these latter actually stick into the walls of the hairs; by this means the hairs are peculiarly adapted for the purpose of absorption.

Root-hairs develop just behind the elongating part of the rootlet, and their use is to absorb water with the food materials it contains in solution. As the extremity of the root advances through the soil by growth, new root-hairs are formed in front of the older ones, while those farthest back as rapidly die off, so that only a short portion of a root bears hairs at any one time. It is usually difficult to see root-hairs growing in the soil, but they may sometimes be discovered with the aid of a pocket magnifying glass by carefully removing the soil from about the younger roots, when the silky network of root-hairs may be seen filling the pores of the soil and enveloping the soil particles. Only that part of the roots which is in front of the hairs is at all active in absorption, in fact absorption is carried on almost entirely through the hairs, and that portion of the root upon which they have died is practically of no more value, so far as absorption is concerned, its uses being confined to being a vehicle for the conveyance of fluids, and for strengthening the plant's position in the ground. The elongation of roots ceases upon that portion on which root-hairs are formed, this elongation being strictly confined to the portion between the hairs and the tip; subsequently roots only grow in diameter in much the same manner as the stem increases in size.

It is therefore obvious that we should aim at creating such soil environment as will conduce to the existence of the greatest number of root-tips; this is brought by the encouragement of root-branching. Roots never branch freely in a hard, lumpy soil. The greater the number of branches the greater the number of root-hairs, and the fact must be again emphasized that these hairs are the most important part of roots as it is through them that almost all of a plant's food and drink is absorbed, and the hairs only grow just behind the young, growing roots. When first formed root-branches are as fine as ordinary hairs, but these branches must not be confounded with root-hairs, and the latter never develop into branches.

Root growth is always excited by suitable soil conditions, but a continual sufficiency of moisture appears to have the greatest exciting cause. Roots frequently develop from parts of a stem that remains for a certain time in contact with moisture. In the tropics, where the air is very moist, some plants, in addition to the previously mentioned orchids, emit roots very freely from the stem above ground, and a marked example of this is seen in the case of *Ficus indica* (Banyan Tree). Cuttings form roots because they are kept in contact with abundant water at a suitable temperature, and cuttings of some plants will root in water alone.

As the cells of new roots are full of protoplasm, they must have access to the oxygen of the air or they will neither live nor grow. This is clearly shown by the following experiment: After thoroughly boiling some water to expel its oxygen pour some of it into two glass tumblers, filling them up to within half an inch of the top; into one pour enough oil—olive or other of a vegetable origin—to cover the water with a film not less than an eighth of an inch thick to prevent any oxygen from re-entering the water. When cool enough place a rooted cutting into each glass; the roots of the one in the water exposed to the air will continue to live, but in the other case where the supply of oxygen is cut off by the oil film, the roots will die. The total absence of live rootlets in the puddled clods of badly tilled soil shows that they will not penetrate soil from which air has been expelled, or into which air cannot enter from want of cultivation.

The roots of practically all garden plants will refuse to enter a water-logged soil and if they were already in the soil before it became water-logged, such a condition will result in their death practically by suffocation.

Planting trees too deeply or raising the soil under trees when grading may result in death owing to the roots not getting

sufficient air. When it is necessary to raise ground about trees, access of air to their roots can be provided for by making a well around and at some distance away from their trunks.

Bearing in mind the fact above indicated that, so far as growth is concerned, the most valuable portion of roots is that from where the root-hairs begin up to the tip, it is very plain that the greatest success in transplanting is only achieved by the most careful handling of the plant's roots. Carelessness in lifting a plant from the position in which it has been growing is a fruitful source of failure in transplanting, especially with nursery stock, which carelessness results in the destruction of the fine rootlets and their accompanying root-hairs. When the lifting has been properly done the same result may be brought about by allowing the fine rootlets to be killed by exposure to drying influences between the time the plant was taken out from the soil and the time it was planted into its new position. Under these circumstances before root action can again come into work new rootlets and root-hairs must be grown. Whether the plant survives the shock of transplanting, or not, will depend upon the length of time which elapses before new root-action takes place. Renewed root-action is frequently retarded, or even prevented entirely, by covering the roots with too rich a soil which has become sour. Renewal of root growth is greatly hastened by covering with sharp sand; cuttings of plants always root more freely in sand than in anything else, and for all practical purposes the growing of new roots from old ones involves the same processes and conditions as the growing of roots from a cutting.

In the case of things which are never sown in their permanent position, annual flower and vegetable plants for example, the practice of growing them in paper pots, or in what are called "dirt hands" is greatly to be recommended. With this method the plant may be put into the ground without removing the pot or band, and however careless or ignorant the planter, it would in this way require considerable effort to inflict damage upon the roots. The preservation of root-hairs in transplanting is greatly facilitated by removing as much soil as possible with the plant. To this end the practice of balling and burlaping is used in connection with the removal of certain plants from the nursery. When taking up seedlings from a seed-bed the root-hairs should not be destroyed by pulling up the plants, but should be preserved by lifting with a trowel. When the soil is dry at transplanting time reduction of the shock is greatly brought about by thoroughly soaking the ground around them the day before. In all cases where death ensues from transplanting it is caused by the roots not having received proper care during or after the operation.

While the minute size of the root-hairs will naturally prevent a single hair from performing much in the way of absorption, still, when we realize that there are millions of these hairs connected with one root system, all co-operating to the same end, it is easy to understand that the aggregate of absorption results in considerable force being accumulated. It is this which causes sap to flow so freely from pruned or injured stems during the growing season. From experiment it has been proved that this absorptive power is most active when the soil is warm, and that within certain limits it decreases with falling temperature and increases with a rising one; and this is irrespective of the atmospheric conditions above ground. When the soil is warm the absorptive power of root-hairs may be sufficient to force water from the tips of leaves during cool nights when transpiration is slight.

In addition to their work of absorption, roots have to excrete much of the carbonic acid formed in the plant during its life processes. This acid acts upon unavailable mineral plant food and renders it available, and in this way roots may be said to make part of their own food. This is clearly proved when plants are grown upon a limestone slab on which the roots will etch out grooves. The same thing occurs when plants like lichens and mosses will eat away the surface of hard rocks and so start the formation of soil. The excretions of substances from the roots of one plant which may be poisonous to others has long been under consideration, and over half a century ago De Candolle held this view. This idea has at the present time, however, little support.

The results of recent studies along these lines seem to point to an oxidizing action in the soil by roots, and while such a process, if it exists, may be of practical importance, there appears little doubt that such action must be very small compared with the effect of the excreted carbonic acid in dissolving plant food out of insoluble mineral matter.

It may be noted that carbonic acid is an excrete product of the protoplasm of every active plant cell.

New York Spring Flower Show—March 14-20

Boston Spring Flower Show—April 6-10

Departments of Foreign Exchange and Book Reviews

FLOWERS AND FLOWERING SHRUBS IN WINTER.

MOST gardeners—professional and amateur—like to see a few flowers and flowering shrubs in the garden during Winter. An outdoor bloom on a dull December or January day seems to possess a value far above the most gorgeous blossom of Summer. However insignificant the pale Winter flower may be, it possesses an outstanding glory. The Summer bloom is just one of a crowd; the modest Winter plant that raises its tiny blossom to the dull grey sky has few rivals to dim its individual beauty. Perhaps that is why the Winter flower is valued so highly. Probably the most popular Winter flower is the Christmas Rose (*Helleborus niger*). It is a pretty plant, and its pure white, simple flowers often beautify some dark corner toward Yuletide. It possesses the great quality of lasting quite a long time, and remains fresh for days after it is cut. If allowed to remain on its native bed the plant continues to put forth its sweet blooms right through the night-time of the year. Another Winter-flowering plant is the Winter Iris, which puts forth its bright flowers during the dark, short days. Then we have that pretty shrub, the *Laurestinus*, which flowers abundantly during Winter, and makes some little spot gay with its clusters of white blossoms. It is very fragrant, and a bush smothered in the beautiful white blossoms during this period of the year is a sight to gladden the heart of the enthusiastic gardener. The old-fashioned Winter Heliotrope also helps to shed fragrance on the Winter breeze, for though the bloom itself is nothing great—quite insignificant, in fact—it has a delicate aroma, and for this alone is worth cultivating.

Later on, of course, we have the sweet little Snowdrop—the most modest of Winter flowers—and the Winter Aconite. The *Crocus*, too, sends forth its blooms whilst yet there is snow in the air and King Frost reigns supreme. Nothing gladdens the eye of the gardener and the lover of gardens more than the sight of a border gay with blooming Crocuses. Winter Sweet is a hardy flowering shrub that makes a shrubbery bright with its yellowish-brown, purple-blotched flowers during December and January. This plant has the excellent quality of being long lasting, and when fresh cut the flowers will keep for quite a long time, filling a room with their fragrance. As a rule this shrub does best if grown against the wall of a garden facing the south or southwest. Another excellent flowering shrub that bears its fragrant blossoms during the early months of the year is the Winter Honeysuckle (*Lonicera fragrantissima*). It is possessed of a sweet aroma, and is one of the best shrubs for the shrubbery. Many gardeners place it against a wall, but this is not really necessary, as it does equally well in the open. *Daphne Mezereum* is another Winter-flowering shrub which is gay with bright red blossoms during February. The leaves do not shoot forth until long after the plant has commenced to flower. The Cornelian Cherry is a fairly large-growing bush that bears small yellowish blossoms towards the back-end of Winter. There are several variegated forms of this flowering shrub, and it possesses this advantage, it will flourish in the poorest soil.

The cultivation of Winter flowers and Winter-flowering shrubs is—or should be—popular with most gardeners, for such give a touch of brightness to the garden during the dull grays and browns of Winter, and we should always hail with satisfaction the blossoms that defy the cold and come forth to break the drab monotone of color prevailing during the Winter.—*Gardening Illustrated*.

AUTUMN BERRIES

The autumn berries and fruits are in many cases so brilliant that one wonders more attention is not paid to them. Special attention might well be given to those berry-bearing plants of which we have at the present time so wide a choice, and which are still being added to, in preference to the breadths of the common Laurel and the mixed muddles of plants that pass as ornamental shrubberies in public and private gardens. Take, for instance, the Rose family, in which the Sweet Briar has several aspects of beauty, but none more beautiful than when laden with its charming hips, which usually hang on the bushes from one year to the other. Among the single Roses how varied are the fruits in color, shape and size. The Japanese Rose, with its huge Apple-like fruits, is at its best in the Autumn, nothing being finer than the scarlet fruits in clusters among the golden-yellow leaves. Then, again, we have the Water Elder, the many Rock Sprays (*Cotoneaster*), and Barberries, while the Hollies, Hawthorns, Aucubas, and Skimmias are hosts in themselves. Few things are more brilliant in the sun on an October day than the

Spindle-tree when laden with its pendulous fruits. What, again, more beautiful than the front of a house covered with the Fire Thorn, with its double season of beauty, its peerless white clusters of flowers in the Spring, and its scarlet clusters of berries in the Autumn? From the wild Roses, that will grow, one might almost say, anywhere, to the *Pernettyas* with their variously-colored berries and lovers of peat and sand, there are berry-bearing shrubs for all situations with enough variety among them to enable the planter to make a selection and use them in a bold, free way.—*Gardening Illustrated*.

A GARDEN OF BERRIES

Why not plant a garden of berries when we have shrubs that yield berries of indigo blue, green, yellow, orange and red—a great range of secondary colors, and white and black? We have Blackberries, Barberries, Snowberries, Bilberries, Partridge-berries, Cranberries, Whortleberries, Mulberries, Elderberries, Strawberries, Raspberries, Gooseberries and a host of other berries. And does not the *Aucuba* bear berries, and the *Cerasus*, the *Crataegus*, *Daphne*, *Gaultheria*, *Pernettya*, *Euonymus*, *Cotoneaster*, *Hippocæ*, *Arbutus*, *Sambucus*, *Skimmia*, *Symphoricarpus* and the *Viburnum*. The Mountain Ash also, the *Pyrus*, *Rubus*, *Ruscus*, Rose, Ivy, Honeysuckle and Holly?

For my part I have a border about 10 yards long by 4 yards deep which I intend to plant with berrying shrubs. My plans are only partly formed, and I desire to help, but in imagination I see the wall at the back covered with *Cotoneaster horizontalis*, *Cotoneaster microphylla* and *Crataegus pyracantha* in all their October glory of fruit and leaf. *Gaultheria Shallon* and *Viburnum opulus* will fill up the larger spaces with *Euonymus europæus*, the white variety of the same, the sea Buckthorn and *Cotoneaster moupinensis*. A clump of *Symphoricarpus*, together with the *Rosa rugosa* and a still larger clump of *Rosa rugosa Moyesii* will occupy a central position with *Cotoneaster frigida* and *Cotoneaster Simonsii*.

The Mountain Ash and the Barberries will have no place in this border stones and rising through them the lovely seed pods of the birds. *Berberis Thunbergii*, however, will be given a place on account of its beautiful color and its lateness, and maybe, some of the newer Barberries also. The whole of the front of the border shall be given over to the beautiful *Pernettyas*, with their large and handsome clusters of red and pink and white berries that hang until Spring is well in. *Cotoneaster adpressa*, *Cotoneaster microphylla*, and other dwarf *Cotoneasters* shall clothe the ground wherever there is room, and the same shall come right over the border stones and rising through them the lovely seed pods of the Gladwin Iris and the scarlet berries of "Lords and Ladies."—*The Garden*.

Viburnum rhytidophyllum.—This is a very handsome species from China, having large evergreen foliage and clusters of yellowish-white flowers. One of the chief charms of this shrub, however, is that the flowers are succeeded by brilliant red berries which last well into the Winter. There are many fine species of *Viburnum* now in cultivation, some of them coloring up well in the Autumn. I saw recently a bush of the common *Viburnum opulus*, the foliage of which was of a brilliant crimson. I had no idea that the leaves took on quite so brilliant a hue.—*Gardening Illustrated*. [The leaves of this shrub are only semi-persistent in this country, as far north as the latitude of Philadelphia.—Ed.]

NATURALIZING PRIMULAS IN WOODLANDS

The term "naturalizing plants" may be defined in two ways, either as the introduction in quantity of plants which grow in similar positions in Nature, or the introduction of garden forms—sometimes of exotic origin—and establishing them where they will continue flowering and seeding without further attention. It is with the second system that I propose to deal.

Success in this form of gardening depends upon two things—choosing the right varieties and putting them in suitable positions. Both of these connote considerable knowledge and experience and a few notes from a place where results have amply justified practice may not be inappropriate.

The woodland at Wisley is in a somewhat moist situation and the trees consist of Oak and Birch which, while providing the requisite shade, do not exclude too much light. At intervals are planted clumps of Bamboos, which not only provide additional shelter, but also form a pleasing setting for the flowers.

With regard to the soil for Primulas, they will grow in any kind of loam, but they will not succeed in pure peat. If, however, a layer of loam is mixed with the surface of the latter, satisfactory results will be obtained.

When making new plantations it is advisable to use young plants in preference to sowing broadcast. Once established they will seed themselves and seedlings spring up in numbers.

The selection of varieties requires a knowledge of the season and color of the plants and their suitability for naturalizing.

The Primula season may be lengthened by introducing Primroses, which are the earliest of all to flower, and the attraction of the wild garden may be varied by the employment of other plants suited to similar conditions. Among these are Anemones, which are quite at home in such an association; *Campanula lactiflora*, which flourishes in grass beneath the partial shade of trees, and *Gentiana asclepiadea*, which grows very freely at Wisley beside ditches, paths and in shady positions among grass. American Lilies, such as *L. pardalinum* var. *superbum* also make a fine display in Summer.

A word may be added with regard to the effects which can be obtained. The sight of hundreds of flower heads of various hues, glowing amid the delicate green of the foliage associated with the subdued light of woodland, is a sight to be remembered—and reproduced—for this form of gardening is quite distinct, and from its very nature possesses a charm entirely its own.—*The Gardeners' Chronicle* (British.)

PRIMULA HELODOXA

One of the finest introductions of late years, *P. helodoxa* certainly takes first place among the many varieties of Chinese Primulas now in cultivation. A strong grower, of the *Candelabra* group, it remains almost evergreen through the Winter, not dying down like many other varieties. The flower stems, of a rich green, grow to a height of 3½ feet or more, bearing an average of six whorls of bright chrome yellow blooms, the calyces being covered with a pale yellow farina. The foliage is of a rich green and of stout texture and vigorous growth.

It is found growing at an altitude of 6,000 feet in open, windswept meadows where it gets a dry and cool Winter, yet in this country it has proved itself quite hardy and a very robust grower. I have grown it in a heavy soil—almost clay—in nearly full sun with some moisture at the roots, and have had flower stems of four feet with nine and ten whorls of blooms. This year I planted out a batch of young plants from seed sown last Autumn, giving them a semi-shaded position in woodland, and I have now—November 15—a quantity of bloom which, even at this late season, is almost equal to that of old plants flowering in June. It seeds freely, and seed should be sown as soon as ripe, as it germinates quicker than if sown in the Spring.—*The Garden.*

PURSLANES (PORTULACAS)

Two months ago I saw a truly wonderful bed of Portulacas. It was, in fact, the first week in September, and, although there had been a great deal of rain and much dull weather by day and cold at night, yet the plants were as robust and healthy as at any period of the Summer, and flowering with wonderful freedom. It matters but little that a storm of rain passes over the bed, destroying its beauty; only let the sun shine out brilliantly for an hour or two, and hundreds of blossoms leap up to open their richly-colored petals. It is the practice to give names to the varieties of double and single Portulacas, but they afford but a small clue to the colors of the flowers. There are nearly a dozen distinct varieties of single forms, and six or eight of the double. Of the former there are white, pink, magenta, rose, crimson, primrose, golden-yellow, etc., and a few of these are reproduced in a double character. I do not think double Portulacas so pretty as the single varieties, but then there are many persons who regard a double flower as a great improvement on a single one, and value it accordingly. When the blossoms of single flowers are fully expanded at mid-day they will repay close inspection by anybody.

There is one good quality about Portulacas, and that is they form a dense, compact green growth, which covers the ground on which they are growing. They really make a good covering for the bare spots where, on a dry soil and a sunny position, little else will grow. This is just the spot for these pretty plants. But we are told in catalogues that the seed requires to be raised in heat, and the plants transplanted to a sunny border. It is not at all necessary to raise in heat. Anyone who has grown Portulacas will find self-grown seedlings come up the following Spring from seeds that have lain in the soil all the Winter. This is proof that the seeds will germinate in the open ground.

The best place to grow Portulacas is a warm, exposed, sunny border. It does not require to be rich. The best plan is to dig the border deeply in early Spring, working in some leaf-mold and road-grit, or siftings from the potting bench, and then, when dug, it should be beaten down, a little hard on the surface, the

seed scattered thinly over it broadcast; or, if it is desired to have lines of colors, the seeds should be sown very thinly in drills; but, as they are so small, the plants in both cases will need thinning out to at least 6 inches, and, indeed, 9 inches apart. The plant soon fills out and covers the intervening spaces. It is of the utmost advantage that the plants be not moved after being sown, and that is why I so strongly recommend the seeds being sown in the open ground where they are to flower. One great advantage is that the plants cover the ground so much more quickly, and come into flower so much earlier in consequence. April is the best month in which to sow.—*Gardening Illustrated.*

CONCERNING GARDEN BOOKS

"Of the making of books there is no end," and not a few of these books deal with the garden. Such volumes are well-nigh indispensable to the gardener, using that word in the broadest sense. He who has a well-selected collection of books upon gardening subjects is a fortunate man. Does a name elude him, or is he uncertain concerning some detail of management or of cultivation, a reference to one of his volumes refreshes his memory. But he must know the name, or the detail, for which he seeks, otherwise the volumes are so much waste paper. It may be put in this way. Books upon gardening are invaluable auxiliaries, but no one can learn gardening entirely by their use. Full knowledge of gardening—and of all things—is only attained by practice, and while elementary instruction is to be derived from books, it by no means follows that even the most painstaking and diligent student of garden literature will ever attain to a thorough understanding of the mysteries of the craft. But practical work in conjunction with well-chosen text-books will carry a man far.

The old "rule of thumb" gardener, who was content to plod along from year to year in the same time-hallowed way, and who despised books concerning the garden, is extinct, or upon the very verge of extinction. The present-day gardener must be—to use rather an objectionable term—"up to date." In order to keep in touch with modern ideas of gardening he must read contemporary garden literature, and here it may be said that in this respect there are books and books. Many are written by men of great practical experience—men who have grown familiar with plants and their cultivation from their youth upward, but who have not the gift of imparting that knowledge in a clear and interesting way, for it by no means follows that the cleverest gardener is the fittest man to write upon gardening subjects. Others, perhaps with less knowledge, write in highly technical terms and use—over-use if the word be permissible—the botanical names of plants. The reader of such a volume becomes involved in a maze of verbosity and the book is soon laid aside. The ideal garden book is that which is written without any striving after "style," in which clear and simple language is used, in which technicalities and the unnecessary use of foreign words are reduced to a minimum; in which, in short, the writer is so full of, and so interested in, his subject that he forgets he is writing a book.

The garden book of other days was a portly volume, durably bound, and expensive. Pages of diagrams are to be found in these books of a bygone day dealing with the minutiae of hothouses—of Pinerias, Aquatics, Melon-houses, and forcing houses of all descriptions. Chapters upon chapters were devoted to the cultivation of now forgotten plants. Even the preparation of such a thing as a Celery trench appeared to call for a special chapter. The result was that, as a whole, such a volume, after it had been purchased, was perfunctorily looked over and relegated to the gardener's bookshelf, from which it was but seldom taken down.

The present-day volume differs almost entirely from its predecessors. There is an almost entire absence of diagram and of illustration, the binding is less ornate, and more attention is paid to clearness and to conciseness of facts. In brief, the writer of the present day garden book credits his reader with having learned at least the rudiments of the craft, and does not, on the one hand, write down to him; nor, on the other, by a display of superior erudition, write over his head. There are many of these very servicable volumes now in the hands of all practical gardeners, for, as has been already said, the old-fashioned gardener who despised, or who affected to despise, books has given place to the man who realizes that if he intends to keep abreast of the times he must own modern volumes dealing with horticulture.—*Gardening Illustrated.*

One trouble with the world is that too many are demanding "gimme" and too few are offering "thank you."

The truth which another man has won from nature or experience is not our truth until we have lived it. . . . He who would be wise must daily earn his wisdom.—*David Starr Jordan.*

DEPARTMENT OF BOOK REVIEWS

LANDSCAPE GARDENING, by O. C. Simonds; large 8vo., X+338 pages, with 60 illustrations; cloth; The Macmillan Company, New York.

In one of his prose writings, read too infrequently, the gifted Edgar Allen Poe imagines a young man generously blessed by Fortune and endowed by Nature most uniquely and lavishly. After thoughtful consideration and earnest reflection, in order that he may devote his ripening powers and talents best to develop his own mind and most worthily to serve his fellow man, he decides to direct them into making more suitable to live in the ground upon which man dwells; he becomes a landscape gardener.

It is with this exalted conception of the art that this book has been written "to help make our country more beautiful." In furtherance of that purpose the first chapter, setting forth the "Aims of Landscape Gardening" has been composed with artistic skill, fineness of insight and delicateness of touch that rival the genius of that extraordinarily artistic race, the ancient Greeks, in whose hands the chisel seems never to have gone too deep, the pencil never to have strayed, nor the pen to have stopped short. It is a prose poem, a cameo.

It is with these sensibilities that the entire book has been formed under the influence in part of his friend Bryan Lathrop, to whose memory the author has dedicated it. In this spirit he endeavors, in this comparatively new country of ours, in which "the struggle for existence has been intense, and the practical side of life has been developed while the æsthetic side has lain dormant, to awaken the great nation to a love of the beautiful in Nature." The reading of the book should help every one mightily toward becoming a leader and in having himself a part in fulfilling this "mission of the first importance." It has been written with the conviction that "even if one should not intend to take up landscape work as a profession, there are few subjects of study which will do more for one's general culture." Although it views all things with the eye of the artist it is in keeping throughout with that wise dictum of the lamented Charles Eliot: "What is fair must first be fit." After seven chapters have been devoted to "General principles and a study of those features that might be introduced into any ornamental grounds" there comes a preeminently satisfactory treatment of "Home Grounds."

But not only are proper prescriptions given for the suitable development of home grounds as commonly defined, large and small; there is a correct stating of the principles that should control the charms of a home in the country also, and even of a home in arid and semi-arid regions, the construction of public thoroughfares, the grounds of railway stations, parks and city squares, golf grounds, schools grounds, arboretums and botanic gardens, cemeteries and city planning. Of the chapters given to these topics in succession the most interesting, perhaps, is the one headed "Cemeteries"; but it is surpassed in merit by one in the first section of the work, the seventh, which treats of water as an element in the landscape.

The author studiously keeps away from the term *landscape architect*, for he believes that the name is "only one of many indications of a tendency to introduce into landscape gardening a formalism based on architectural lines and principles which, if not checked, will very soon debase and degrade it." He avoids laying down any rule of thumb methods and contents himself with putting into his book but few sketches for the development of home grounds. His pictures all are chosen well. One could only wish that more were used.

THE MUSIC OF WILD FLOWERS, by John Vaughan, A.M.; 181 pages, 8vo., cloth; E. P. Dutton and Company, New York.

This is a collection of botanical essays contributed, at various times, to English journals and magazines by the Canon of Winchester. Its title was suggested by words of Doctor Arnold of Rugby who, realizing how limited was his capacity for enjoying what many regard as the finest of the arts, used to say, "Wild flowers are my music." Other distinguished Europeans are cited to make an introductory chapter most entertaining in showing how great characters, known to the world in general through works in no way suggestive of Flora's cult, yet have found sweet solace in her gracious ministrations. And other surprises come as the curtain is drawn aside to reveal, in their native haunts, lovely flowering plants that to American readers at least are known only in gardens or thought of as existing more in the writings of poets than as actually growing in the soil of English, Welsh, Scotch or Swiss woods, meadows and shores. The marsh gentian, the blue cowslip, the *lupægia*, the summer's lady's-tresses, the sea lavender and the yellow horned poppy, than which the Canon thinks there is perhaps no more beautiful wild flower,

are met in the comfortable and peaceful enjoyment of their own homes. But that is not all; to the American reader it gives a start to be brought into the presence of goodly colonies of flowering plants that to him usually seem to be the products of nurseries in his own land or in Holland: the very rare sea-buckthorn, the *Daphne mezereum*, scillas and grape hyacinths, fritillaries and wild daffodils. In connection with the mention of daffodils is advanced a pretty theory to account for the fact that the finding of a white species of a blue or purple flower is so uncommon. The earliest petals were flattened stamens, and since stamens are mostly yellow the flowers were yellow likewise. Then some of them became white; after that, in the course of ages, a few of them grew to be red or purple; and finally a comparatively small number acquired various shades of lilac, mauve, violet or blue. But plants, like men, sometimes show a tendency to revert or relapse. Now primary yellow flowers, like the buttercups and potentillas, show little or no tendency in a state of Nature to vary in color, for the simple reason that they have never passed through any earlier stage to which they can relapse. White flowers, again, seldom vary, though now and again there is a tendency to revert to the earlier stage of yellow. It is, however, strange as it may seem, with the more highly developed blue flowers that this reversion to white is mostly seen.

The little book makes most appeal, of course, to sons and daughters of the British Isles. But Chapter IV, which treats of the flora found on old walls and Chapter XIX, which treats of climbing plants, have a more general interest and are even of suggestive value in garden design. All is good reading for early Spring just before the melting of the snow lures one's steps out upon the hillsides.

THE LAWS OF HYBRIDIZING, by Richard Diener; 16 pages, with portrait, other pictures and chart; 4to, cloth; published by the author at Kentfield, California.

Several extracts, without comment, will give an idea of what is contained in the six and one-half pages of text in this pretty booklet.

"Since the beginning, untold numbers of plant life have been created continuously by the sun's rays in water or moist places where conditions are favorable. But of those untold numbers only such as had the ability to sport could climb the ladder of evolution. * * * Prior to the acquisition of sex, when the propagation of plant life depended entirely upon the splitting-apart process, any variety which did not produce a sport during its cycle of existence was doomed to extinction. * * * Though it took thousands of crosses and about fifteen years of time to perfect the actual laws I herewith submit; these laws accomplish by short direct method what it would take Nature thousands and hundreds of thousands of years to do in a natural way."

If the pollen parent is one-half the size of the ovule parent the resulting offspring will be one-half the size of the pollen-bearing parent; this is "the first or declining way." If pollen-and-ovule-bearing parents of exactly the same size are used an "actual doubling of size will be secured in the offspring;" this is "the second or enlarging way." Finally, if the pollen-bearing parent, or male, is twice as large as the female the offspring will be only slightly larger than the larger parent. These laws govern animal life also, for, after a cock had been mated with a hen of the same size and produced offspring, one of these pullets was mated with its sire and became the parent of offspring, one-third of which were twice the size of the fowls first mated. This law is qualified only by the fact "on account of the sexes being in different individuals it takes two crosses to reach the same result that is obtained by a single fertilization in the case of plants where both sexes reside in the same individual."

"The pollen-bearing parent is always the dominating factor in changes of form or color." "In attempting to derive new colors always use a white flower as the ovule-bearing parent with which to break up colors."

"Few people at the present time realize the immensity of this discovery to mankind. It is equal to the discovery of electricity, if not greater. It means that the farmer and horticulturalist will get three to four times the amount of fruits and grains from the same land without any additional fertilizers or expenses, simply by using varieties developed higher through these laws from the varieties in use now."

I who have written this have myself seen results of his work with flowers that have greatly enriched the world; but it is certainly to be regretted that the booklet is so brief and does not explain matters with more detail.

One must be an inventor to read well. As the proverb says, "He that would bring home the wealth of the Indies must carry out the wealth of the Indies." There is creative reading as well as creative writing.—Emerson.

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THE ASSOCIATION AT THE NEW YORK SPRING FLOWER SHOW

The association has engaged space at the New York Spring Flower Show, to be held at Grand Central Palace, March 14 to 20, for a reception room and information bureau for the convenience of country estate owners. The secretary will be in attendance throughout the show to discuss any subject that may relate to the gardening profession, and the engaging of efficient gardeners.

NEW ENGLAND CONFERENCE AT BOSTON APRIL 7

A gardeners' conference under the auspices of the New England members of the association will be held at Horticultural Hall, Boston, on Thursday afternoon, April 7. This will be during the week of the Massachusetts Horticultural Society Spring Show, and show of the American Rose Society.

1921 CONVENTION COMMITTEE TO MEET FEB. 18

The 1921 Convention Committee appointed by President Craig will meet at the association's office in New York, February 18, to organize and to discuss the plans for the 1921 convention, which will be held in New York city this fall. The committee is already in receipt of an invitation from a friend of the association to have the attendants at the convention visit some of the fine gardens on Long Island on an automobile trip, with luncheon at one of the prominent country clubs.

NASSAU COUNTY (NEW YORK) TO ORGANIZE A LOCAL BRANCH

A movement is on foot to organize a local branch of the National Association of Gardeners in Nassau county (Long

Island) N. Y., to promote the interests of the profession and the welfare of the members in the Nassau county community by informing the country estate owners of the aims and purposes of the association, and by keeping them advised on the activities it is engaged in—in brief, to establish a more confident relation between the gardener and his employer.

CONCERNING THE ASSOCIATION AND ITS POLICIES

There has been some criticism respecting the increase in dues, some members contending that they are not in sympathy with being taxed to support the Service Bureau; others that they do not see where they get their money's worth out of the association. This, however, may be accepted as a minority protest, for up to February 1, more members paid their dues than had been paid up to March 1 last year, which was a record year. A western member writes, "I think it is a wise move to increase the membership fee, rather than to depend upon the individual generosity of the members to carry on and further the good work the association is doing for the gardeners as a class." Some members appear to overlook the fact that the Service Bureau covers practically all the work the association is engaged in, and is not limited to merely placing gardeners in positions. Those who cannot see what benefit the association is to them should carefully study the article on another page of this issue, "Consider the Gardener." They will find their profession does require representation such as only a national association can provide.

Some members have taken exception to the publicity given to the expelling of a member for unprofessional conduct. The committee which acted on this case carefully considered the matter of making its action public, and decided that if this was not done, the intended effect of the expulsion would be lost. We know of at least two instances where employers have communicated with their gardeners, congratulating them on the attitude of the association in its effort to elevate the standard of the profession.

EXAMINATIONS FOR GARDENERS

An article by Arthur Smith on "Examinations and Classification for Gardeners," was scheduled for the February number, but believing that the article, "Considering the Gardener," vitally concerns the profession, it was given preference in this issue. Mr. Smith's article will appear in March, followed by some interesting communications on the same subject from other members.

NEW MEMBERS.

The following new members have been added to our membership list: John W. Pottinger, Oakdale, L. I.; Percy Green, Locust Valley, L. I.; Arthur Ford, Fairmount, West Va.; Theophile Henky, Port Chester, N. Y.; George Annand, Glen Riddle, Pa.; John F. Ward, Windsor, Conn.; R. S. Hurst, Middleton, N. J.; Alec Arthur, Villa Nova, Pa.; William J. Jess, Sewickley, Pa.; D. Mackay, Short Hills, N. J.; W. Woodward, Roslyn, L. I.; Robert Marshall, Somerville, N. J.; John A. Brooks, Detroit, Mich.; Wm. Reoch, Auburndale, Mass.; Albert J. Hawkes, Norfolk, Va.; Irving Schofield, West Orange, N. J.; John R. Jackson, Union Hill, N. J.; Frederick C. Sorge, Deal Beach, N. J.; Carl F. Eicke, Watson, Ark.; William H. Ward, Astoria, L. I.; George Stewart, Garden City, L. I.; William A. Poetain, Pittsburgh, Pa.; Thomas Coll, Jackson, La.; John Sives, Glen Cove, L. I.; Archie Campbell, Brooklyn, N. Y.; George Walker, Highlands, N. J.

AMONG THE GARDENERS.

Jack Baxter resigned his position as gardener on the Charles H. Thorne Est., Lake Forest, Ill., and has accepted the position of gardener to the Glen Echo Country Club, Normandy, Mo.

L. P. Hansen has secured the position of gardener to Mrs. H. J. Lutzer, Orange, Texas.

John R. Jackson has secured the position of gardener on the estate of H. Schwarz, Greenwich, Conn.

H. A. Brown secured the position of gardener to E. P. Baugh, Achlynn Farm, Revell, Md.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Here and There

SHRUBS UNDER TREES.

The question is often asked, what shrub will grow well under trees? In making a selection of shrubs for such a purpose it is necessary to know whether the trees are of dense growth, like the Evergreen Oak or Beech, under which very few plants will thrive, or thin-headed trees, like the False Acacia or Ash, under which numerous kinds may be grown. As a general rule, most shining-leaved shrubs will thrive as undergrowth beneath the shade of trees, but, in any case, the soil must be well prepared for them at the outset. If the large trees have been planted within recent years, and the soil is tolerably good, but little preparation is necessary beyond deep digging; but if the trees are large and old, then the soil will be found over-run with roots and impoverished. In this case fresh soil should be substituted (say from 9 inches to 12 inches deep), and in this the shrubs intended for undergrowth should be planted. The small shrubs should be vigorous and with plenty of roots, and the best time to plant is during September and October, allowing the leaves that fall from the trees to remain among them through the Winter. The choice may be made from the following list: Common Holly, *Berberis aquifolium* or *Mahonia*, common Box, Oval-leaved Privet, Portugal Laurel, *Rhododendron ponticum* (if no chalky matter is in the soil), *Cotoneaster Simonsi*, *Skimmia oblata*, *Berberis Darwini*, *Berberis japonica*, and common Yew. All these are evergreen. For very dense shade I have found nothing better than the Butcher's Broom (*Ruscus aculeatus*), with an undergrowth of the creeping St. John's-wort (*Hypericum calycinum*), Periwinkle and Ivy. The common English Ivy grows naturally in dense shade, but the Irish Ivy has a bolder effect. *Gaultheria Shallon* may be planted in light or peaty moist soil, and a good carpet-like growth may be had of *Euonymus radicans* and its variegated form. There are few Summer-leaving shrubs that grow well under trees.—*Gardening Illustrated*.

COLOR IN THE GARDEN IN WINTER.

The introduction of new species and varieties of hardy trees and shrubs is gratifying, especially in regard to kinds which allow of effective display during the Winter. Beauty of form and color are not obtained by the massing of evergreens. A judicious planting of both deciduous and evergreen species is desirable; these may be grouped either separately or together. Each type provides admirable specimens. Light, space and contrasts are essentials in the relief of sombre scenes; therefore, first consider the existing arrangement of the background, or outskirts of the garden. The stems of trees having a distinctive form of coloring, such as a Silver Birch or a Gnarled Oak, should be clearly visible, and subjects planted in

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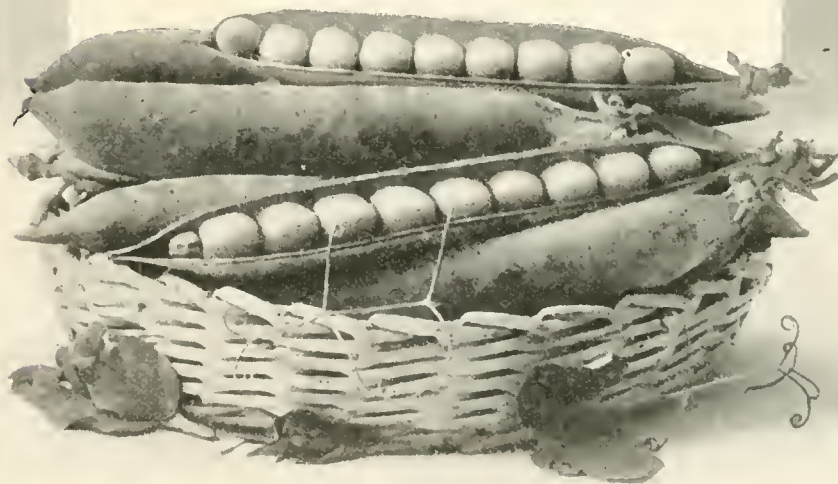
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close proximity should either harmonize or form a direct contrast. It is sometimes advisable to remove the lower branches of Fines, in order to exhibit a greater length of stem; the same remark applies to many other trees. Dwarf Furze, *Daphne Mezereum*, *Laurustinus*, *Berberis* in variety, and the catkins of *Garrya* and Hazel are effective in the foreground; whilst *Saxifraga*, *Heuchera*, *Hellebores* and hardy Heaths—especially *E. cornua* and *E. codonodes*—are pleasing when planted in various positions. Red and yellow Willows may be cut hard back in Spring to furnish more color, but those having sufficient space to display their true form should not be thus treated. Varieties of *Acer* and *Prunus Davidiana* are worthy of inclusion; the former for their differently colored twigs, and the latter for its blossoms in both forms, pink and white. Winter Jasmine is invaluable, and a cosy corner should be chosen for *Chimonanthus fragrans* and Winter Honeysuckle. It is commendable to plant subjects like *Pernettya Cotoneaster* and Hollies which carry bright berries; the birds may remove the berries, but the foliage remains and is quite distinctive. When planting, remember the value of Autumn tints, and the first flowers of Spring; thus will the attraction of the garden be enhanced.—*The Gardeners' Chronicle* (British).

BUDS OF THE LILAC

It is a common belief that plants put on their buds in Spring, the noticeable swelling of these objects in early Spring being mistaken for their initial appearance. As a matter of fact, new buds begin to be formed almost as soon as the old ones have opened. By mid-Summer, the buds of most trees are well developed and the practice of budding is usually carried on then. Other species, of which the common lilac is a conspicuous example, form their next season's buds still earlier. By the end of May the lilac has finished its season of growth, so far as the elongation of the stem and the production of buds is concerned, and the Summer seems to be spent waiting for a new Spring.—*The American Botanist*.

"WINKING MARY-BUDS"?

Referring to the quotation from *The American Botanist* in the January issue as to whether Shakespeare's "Winking Mary-buds" meant Marigold or Buttercup, it would appear that the writer overlooked the Corn Marigold, which in some parts of Shakespeare's country is as common as the Corn Poppy; this is known as *Chrysanthemum segetum*, which has a variety equally common, separated in some works as *grandiflorum*, and which has flowers as large as the *Calendula*. I venture to suggest that if Shakespeare meant marigold at all it would be the above rather than *Caltha palustris*.

ARTHER SMITH.

LOCAL GOSSIP.

Peter Lower was digging away at the weeds in his potato patch.

"Makes it harder to have the weeds so thick, don't it?" remarked Lem Beebe, leaning over the fence.

"Nope; easier," declared Pete; "you don't have to walk so far to the next weed."—*Everybody's Magazine*.

"What do you know about the language of the flowers, Bill?" one young fellow asked another.

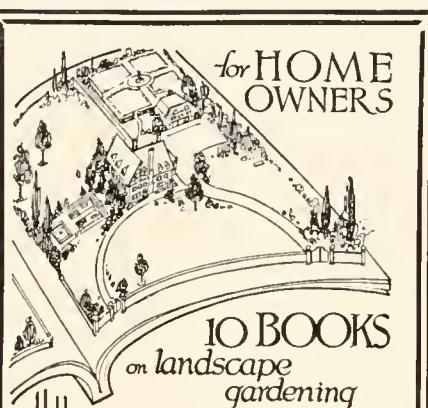
"Well," said Bill, "I know this much about it—a \$2 box of roses talks a heap louder to a girl than a 50-cent bunch of violets."—*The Globe*.



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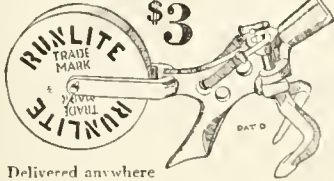
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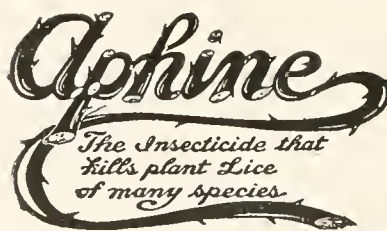
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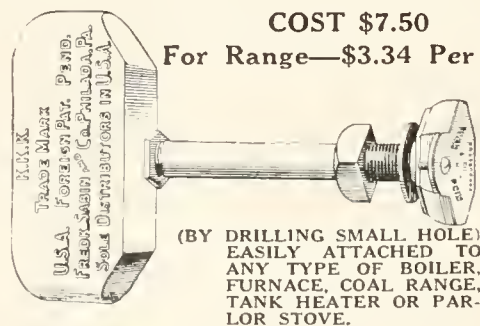
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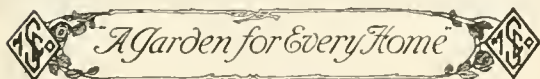
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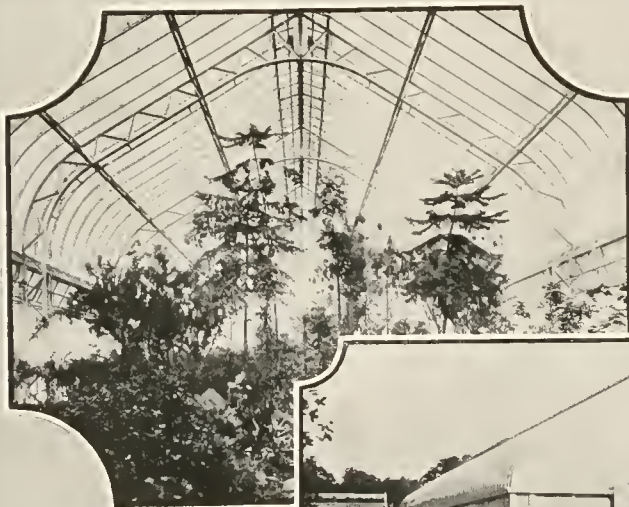
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

MARCH, 1921

No. 3

Things and Thoughts of the Garden

MONTAGUE FREE

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GARDEN

WHEN writing last month of some of the introductions of Veitch & Sons a train of thought was started which led to some reflections on the romance of plant collecting and to the reperusal, after a lapse of twenty years or so, of a boys' book of adventure called "The Orchid Seekers: A Story of Adventure in Borneo," by Ashmore Russan and Frederick Boyle.

The reading of this book, when a garden boy, did much to make tolerable those burdensome chores which are inseparable from gardening, and which are so often, inadvisedly perhaps, put upon the shoulders of a beginner. When chasing mealy bugs and scales with sponge and brush in the steaming stove, the remembrance of the adventures of daring Ralph Rider and his companions when orchid seeking in Borneo, tended to counteract the soporific influence of the employment; and musing upon the romance and glamor of plant collecting, that the authors so admirably succeeded in depicting, was instrumental in lessening the ennui consequent upon the seemingly interminable crocking of pots.

It is a story of a search for a "blue orchid" in Borneo. The personality of the leader of the party, Carl Hertz, was evidently moulded on that of Benedict Roezl, one of the greatest of plant collectors, whose name is commemorated in many of our glass house favorites; for Hertz, like Roezl, had lost one of his hands and used an iron hook as a substitute. Doubtless, as a concession to the demands of the reading public, who require much of their book heroes, Hertz was somewhat of a superman, for we learn he "was acquainted with every tree and herb in the universe, or nearly so," which seems to us moderns to be an almost impossible accomplishment. The other principal members of the party were two sons of Mr. Rider, an orchid importer, located in England, and Bounce, a sailor, who provides the comic relief.

When books of this nature deal with plant life one expects to find glaring mistakes and arrant misinformation likely to raise the scornful ire of botanist or gardener, but "The Orchid Seekers" is an exception. The junior author, Frederick Boyle, is a traveller, amateur orchid grower, and writer on horticultural subjects, and has a vast fund of reliable plant lore. In the "Orchid Seekers" the characters speak glibly and correctly of such tongue twisters, from the layman's point of view, as *Phalænopsis*, *Grammatophyllum*, *Dendrobium* and *Calogync*.

So well is the pill of botanical knowledge coated with the jam of adventure that the information given may be absorbed unconsciously—sometimes a desideratum when

dealing with the problems of adolescent education. Thus there are discussions on the fertilization of orchids, conducted with interruptions occasioned by thrilling game hunting interludes, and we learn of the ingenious mechanism which insures the cross pollination of the Bucket Orchid, the curious tumbling lips and awful odor of some of the *Bulbophyllums*, the spring gun contrivance which ejects the pollinia of *Catasetum*, and of the adventures of insects in the slippers of *Cypripediums*. The story is told of *Angracum sesquipedale*, that plant curiosity with a nectar tube one foot or so in length, which impelled Darwin to make his famous pronouncement that there must be a moth with a proboscis long enough to reach to the bottom of the tube—a statement that was afterwards proved to be correct by the discovery of such a moth.

The question "what is an orchid," put to the leader of the party by one of its youthful members, is one that might puzzle many of us to answer offhand, without recourse to a botany. Hertz, however, is quite equal to the occasion, and holds forth somewhat as follows: "Orchids are petaloid Monocotyledons mit irregular perianth and inferior ovary, gynandrous. . . . Orchids are a family of monocotyledonous phanerogams mit albuminous seeds und an undivided embryo." One suspects that Hertz was showing off, and in spite of the scientific terminology of the preceding, we prefer his final offering as a more simple and comprehensive definition of an orchid. "An orchid ish a flower dot consists of tree sepals und tree petals, mit de organs of reproduction—separate in oder plants—fused togedder."

All this sound horticultural and botanical knowledge is interspersed with accounts of hairbreadth escapes from varied dangers, fights with Salu pirates, adventures with poisonous snakes, encounters with Chinese secret societies, and with Pakatans, adepts in the use of blowpipes and deadly poisoned arrows. This is the style of writing dear to the heart of the adolescent male, and I can think of no better literary fare to place in the hands of a budding gardener. Such a book as this is worthy of the attention of those who are anxious to interest young men in horticulture as a profession. However, it may necessitate some searching to obtain a copy, as it is quite a number of years since it was first published, and it may be scarce.

Of course, it is not at all necessary to delve into the realms of fiction to find thrills in connection with plant collecting. (Actually the incidents described in "The Orchid Seekers" are founded on facts.) A book by Frederick Boyle, "The Woodlands Orchids," is a descrip-

tion of this famous amateur collection, interspersed with stories of orchid collecting, in which incidents are described as strange, wild and exciting as any conceived in the brain of an imaginative writer. The story of *Bulbophyllum barbigerum*, for example, tells of a young clerk in a factory at Whydah, on the Gold Coast, who made a practice of collecting this orchid in his spare time with a view to making money on the side. In so doing he incurred the wrath of the fetish priesthood, and things began to happen. The unfortunate youth was thrust into the Snake Temple. "There are men who would have lost their wits in terror at that sight. The snakes were there, hundreds of them, perched upon the thickness of the wall, the ridge of their bodies gleaming in the red light of sunset, their long necks hanging down, waving and twining. Every head was turned towards him, the glass bright eyes fixed on his, and the tongues slithering with eagerness. Nightmare was never so horrible." He managed to burst through the doorway and through the guard. The influence of the Europeans of Whydah was sufficient to mitigate his punishment to that of "the man who kills a snake by evil chance—no worse." This was bad enough, in all conscience, for he was put into a hole in the ground covered with reeds, which were afterwards set on fire. His chance for life was then to get up, run the gauntlet of natives who would try to cut and hack him until he reached water, when he would be free. It is satisfactory to know that he escaped with but little hurt.

That plant collecting is not without its humorous side is demonstrated in the story of Roezl's acquisition of *Cattleya Skinneri alba*. It was the custom in many parts of South America for the natives to plant on the roof of the local church any rare orchids that they chanced to find. Great value was placed on these orchids, and only with great difficulty could they be induced to part with them. Roezl found the white form of *Cattleya Skinneri* on the roof of a church in a village in Guatemala. The problem was how to get it. It so happened that with the exception of getting drunk, cock-fighting was the one amusement of the population, and the Cura was the leading exponent. The champion cocks of the village had recently been badly beaten by those of a neighboring village, and everyone was despondent and anxious for revenge. This was Roezl's chance. How he came to be possessed of a knowledge of cock-fighting is not explained, but such was the case, and, in return for giving some hints to the Cura as to the proper management of the birds, he was allowed to remove the white *Cattleya* and "sold it to Mr. George Hardy, of Manchester, for 280 guineas." Which goes to prove that versatility is a desirable item in the equipment of a plant collector.

* * * *

The introduction of tropical plants, in the early days especially, was not a particularly healthy occupation. These enterprising and courageous collectors had to face all kinds of dangers from hostile natives, fever-ridden climates, and varied perils of travel by land and water, and many lost their lives in the endeavor to introduce plants that now adorn our gardens.

Glancing over an account in "Hortus Veitchii" of the collectors employed by Veitch & Sons, we find that many of them came to an untimely end. Richard Pearce, to whom horticulture is indebted for the introduction to cultivation of many of the Begonias which were the parents of tuberous begonias as we know them to-day, succumbed to fever in Panama when on the way to a collecting ground in South America. David Bowman died of dysentery in Bogota. Henry Hutton died an early death in Java. Gottlieb Zahn perished by drowning on the way to Costa Rica. J. H. Chesterton, who successfully intro-

duced *Miltonia veitchiana*, died at Puerto Berrio from illness contracted when on a collecting trip. An extract from an obituary notice is illuminating and indicative of one of the qualifications of a collector. "Poor Chesterton's reckless spirit rendered him very efficient as a plant collector." Gustave Wallis, whose work is commemorated by many plants named for him, including *Anthurium Wallisii* and *Epidendrum Wallisii*, died at Cuenca from fever and dysentery.

Not only were the collectors exposed to great hazards, but the plants too were subjected to many vicissitudes, and often arrived at their destination in a dead or dying condition owing to the lack of swift transportation. Not only that, but many collections were lost outright by such misadventure as trouble with natives, necessitating the abandonment of collections, shipwreck or fire. The latter was illustrated in the *Florists' Exchange* of January 15, 1921, in a paragraph of the obituary notice of the late H. F. C. Sander, founder of the firm that bears his name—one of the most famous in the annals of orchid growing and importing. We learn that the first large consignment of *Dendrobium Phalaenopsis Schroderianum* was burnt up in a sailing vessel. Boyle, in "The Woodlands Orchids," gives a full account of the incident. Micholitz was the collector, and had obtained a large quantity of this desirable orchid. During the process of collecting he was compelled to witness many horrors perpetrated by murderous natives and joyfully turned his back on the bloody spot. With his shipload of treasures he arrived safely in a port where the orchids were to be transhipped to a steamer that would convey them to England. During the night, however, the sailing vessel caught fire and the orchids were a total loss. The almost monosyllabic cable exchanges between Micholitz and Sanders are related by Boyle as follows:

"Ship burnt! What do?—Micholitz."

The reply was emphatic: 'Go back—Sander.'

'Too late—rainy season.'

'Go back.'

So there was nothing for Micholitz to do but return to that blood-stained island in the rainy season and again collect the "Elephant Moth Dendrobe." This time it was found growing in abundance in the graveyard of the tribe—a place where the dead were laid on the ground beneath the sky. Thus it happened that one of the Dendrobes sold at "Protheroe's" [Protheroe & Morris, the well known English firm of horticultural auctioneers], on October 16, 1891, was "attached to a human skull." No! Horticulture is not altogether prosaic.

Shipwreck seems to have been the lot of many of these collections of plants obtained from the wilds at the cost of, sometimes almost superhuman effort.

Peter C. M. Veitch had the misfortune to lose the whole of a collection of plants made in the Fiji Islands when the vessel in which they were being transported was lost in a gale. This was in 1876. In the following year he made collections in Australia, and on the way to New Guinea was shipwrecked, again losing his collections.

Charles Maries, remembered in gardens by *Abies Mariesii* and *Platycodon Mariesii*, when collecting in Japan, shipped his collections "in a vessel laden with seaweed bound for Hakodate, but which was wrecked the following morning; the seaweed, wet and swollen, had burst open the vessel and the captain ran her ashore. The box containing the seeds was rescued and put into another boat, which immediately capsized and sank."

It surely adds to the interest of gardening and removes any suspicion of humdrumness when we realize the stirring incidents that accompanied the introduction of many of our treasures.

American Rock Gardens

RICHARD ROTHE

CONFRONTED by rock garden problems, at a time lying beyond a long evolutionary stage abroad, with European books richly illustrated by views of inspiring achievements at hand, we find ourselves more or less at an advantage. The near future is going to reveal whether the growing popularity will prompt our craftsmen to spare no effort in establishing right at the start an artistic standard worthy of the designation American, or, whether we leave popularity growing into a mere fad, doomed ultimately to amount to nothing. The best remedy for averting the dangers of the latter alternative are American object lessons demonstrating the natural possibilities and their limitations within our different States and climates. Our home owners desirous of enjoying a rock garden are at present most eager to know and, if possible see, what we have been doing and what we can do.

Adopting the rather broad definition of a rock garden as a combination of the beauty of rocks and natural rock-compositions with the beauty of plant-life indigenous within mountain regions, it is necessary to say that for perfect development of the latter we must have a rich porous soil and a liberal amount of stone material as moisture retaining and cooling component mixed in. The rock-material for the building of the visible surface construction, serving as receptacle and stage for our floral displays, is to be of natural color and shape. As we are expected to attach beauty to the various formations and outlines of rockery constructions, it is obvious that one of the fundamental requisites for effective work consists of the faculty to discern the elements of beauty in rocks and natural rock-compositions. Here initial inefficiency does not necessarily need to despair. When studying our rock-strewn mountain slopes, the ledgy plateaus, the deep ravines with their gushing streams and the cliffbound sections of our seashore lines, the novice will be amazed over the abundance of object lessons for gaining the desired subtlety of vision.

Visual sensitiveness, the most essential attribute of a genuine rock garden builder, will guide him to adhere to the simple boulder effect on the level or near level ground;

it will enable him to master the problems of hill and mound by effective distribution of the masses, and it will aid him in modelling the picturesque ruggedness of ravine and steep slope.

Rock gardening on a large scale pre-supposes natural conditions adaptable for it. Ingeniously designed examples with mountain sceneries *en miniature*, natural cascades and rock-bound pools and lakes, are not very rare in Great Britain. Examples of such magnitude no doubt we may hope to see and enjoy sooner or later in some of our leading public parks. At present it is principally the beauty-loving private home-ground owner who is most interested in our subject.

And here, right at the very beginning, it is best to admit frankly that within the precincts of the average sized lot the prevailing conditions for the introduction of a rockery seem anything but propitious. The cases where an old abandoned quarry-hole—a most coveted proposition—is waiting for the landscape architect with the soul of a poet and the sensitiveness of an observant naturalist to transform its commonplace appearance into a nook of fairyland are, indeed, extremely rare. I believe, not until we learn to rid ourselves of the assumption that our work must be a harmonious part of a landscape scheme can we readily and satisfactorily meet the desire of a flower-loving suburbanite for enjoying a rockery. When aiming simply to make it a distinct object of



Pathway Effect of the Author's Rock Garden, Glenside, Pa.

beauty out of door, as for instance, a large canvass of a landscape may constitute the dominant ornamental feature of a hall or library, the problem is less complicated. Our picture of the rock garden of Mr. Gustave Hecksher, Strafford, Pa., situated on the front lawn, several hundred feet from the residence, seems a conceivable exemplification of this.

A clear, consistent and sincere conception of the origin and purport of rock gardens is the best safeguard against serious mistakes in the selection of the life-material. It also decides the issue regarding the subsequent arrangement of plantations. Being in its essential part of a dwarfy, more or less diminutive form, it is often surprising how many of those highly attractive and interesting

plant species even a small rockery can hold. This occasionally misleads owners into acquiring the possibly largest collections with the result of making a botanic garden out of a rockery. Botany, however, is a science, and gardening in its purely decorative potentialities is an art—two entirely different things with no connecting link existing.

Watch the phenomenon of the awakening of the vegetation within the regions adjacent to the eternal ice of the glacier. The powerful sun-rays of June finally suc-

ceed in removing the last vestiges of a thick and heavy mantle of snow. At once the emerging verdure of herb growth, densely covering the ground, appears sprinkled over with color. Within the course of a few days myriads of little blossoms open, forming solid sheets of brilliant hues in great variation. It is this incomparable spectacle of radiant color-gaiety which prompts us to make color our medium of expression in rock garden planting.



Rock Garden of Gustave Hecksher, Strafford, Pa.

As most of the strictly alpine plant species, chiefly for climatical reasons, proved unavailable for the American rock garden, we have learned from the very start to rely on our native vegetation. The great mountainous districts of the northern part of our hemisphere are distinguished by a flora unusually rich in beautiful trees, shrubs and herbaceous plant life easily domesticated and resistant to withstand hot waves during Summer and the frigid periods of even our northern Winters. With leading nurseries now carrying assortments of the best rock garden habitants on their stock lists, and garden magazines publishing articles on the rudimentary side, the impetus of countryside connoisseurs in their desire for the enjoyment of the beauty, invested in this subject, occasionally impels to exertions of personal ingenuity. Results differ, but on the whole, there is good reason for encouraging such attempts. I know of instances demonstrating surprising deftness in coping with intricate problems of the construc-

ional part and, in regard to planting, I have seen arrangements composed by students and lovers of Nature representing wonderful feats of cleverness. For producing impressive floral color effects we need an open sunny exposure. All plantings should be done in early Spring or early Autumn. The illustration of the rockery of Mrs. Andrew Adie, Chestnut Hill, Mass., depicting a general aspect of work immediately after planting, evinces the necessity of the vegetation first forming a unit with the rock-setting before we may arrive at the illusion of natural reality. This, however, the creeping growth of most of the hardy herbaceous material very quickly establishes, and moreover, we are going to be regaled by a fair display of blossoming and floral color notes during the first year. The enjoyment of a full color tonality in rock gardens begins with the second season. Being in its essential part vernal, the preludiary accords are noticeable as early as in March, increasing steadily in number and volume until reaching the great festive climax during May. South of New York, beginning the second week in June; throughout the New England States perceptible as late as the end of June, the diminuendo sets in, going down to the level of an amiable mid-Summer and Fall modesty in floral array. This confrontation with an unusually bountiful beauty in blossoms and hues immediately after a weary Winter's ending, when our mind and vision are most appreciative and susceptible, exerts its

charm. We gladly accept it as a greeting from distant hillsides. We interpret its meaning as being a message out of the clarity and the invigorating atmosphere of high altitudes, where, in giving cheer to apparent desolation of avalanche and wind-swept mountain recesses, Mother Nature, kindly disposed, proves lavishly liberal in applying the brightest tints from her color palette. Void of every-day conventionality, the vernal glory



Entrance to Author's Rock Garden, Glenside, Pa.

Void of every-day conventionality, the vernal glory

of the rock garden, touches the sunny lyrical cord in human emotion. Its most enchanting features are the evanescent character of floral color effects and the sensation of a lasting and happy security in its structural endurance, as well as in the hardiness and longevity of its vegetation.

Purport and aims of our work at heart, we soon realize, that for its artistic concentration of thought and the faculty of perceiving beauty almost intuitively is the



Rock Garden of Mrs. Andrew Adie, Chestnut Hill, Mass., immediately after planting.

paramount issue. As for advanced amateurs, the fact that even the designing and building of a small rockery is apt to tax personal ingenuity in a most delightful way, no doubt, will be one of the alluring incentives for self-activity. Enthusiasm and the communicative joy of work accomplished with love, especially in all those instances where results, by virtue of artistic merit, compel general admiration will make a rockery the pride of a home. In establishing and further developing artistic conceptions, we are profoundly sure the educative tendency and friendly rivalry between the members of our leading garden clubs is going to prove instrumental. A rockgarden, however, can hardly be construed as being a means for displaying mere splendor. As a conspicuous outdoor feature of a home, it is an indication of refinement preferring the sunny, healthy side of life. No matter how small and unpretentious or how extensive and elaborately designed, the American rockgarden, as we have it in mind, should reveal our intention to enjoy beauty conceived direct out of our own primitive Nature—the rejuvenating well of Art. Looking at the rockgarden from this viewpoint, I believe we have good reason to welcome its recent advent and rejoice over its growing popularity.

If you hit the mark you must aim a little above it; every arrow that flies feels the attraction of earth.—*Longfellow.*

HAS PERFECTION BEEN REACHED IN ROSES

ONE of the most interesting and instructive themes for discussion at a meeting of the Rose Society would be the question—Has not the acme of perfection of beauty been reached in the present best varieties of roses or is further improvement possible?

Certainly it would seem undesirable to increase the size of blooms. If roses could be grown as large as the largest peonies, (except for exhibition rivalry), they would not be preferred by those of refined taste. The dahlias, asters and chrysanthemums of monstrous size to be seen at flower shows cannot compare in artistic beauty and grace, with those of the natural and medium sizes. The same applies to chrysanthemums, dahlias and asters, the first mentioned, when grown naturally or in sprays are by far the most graceful and desirable for their decorative quality.

The points of improvement yet desired are hardiness for out-door culture, delicate fragrance and beauty of foliage and increase in the range of color and shadings, to be made possible perhaps through some scientific discovery yet to be. For instance a black rose with either golden, white or pink stamens, or roses of the beautiful russet and brown shadings would be most artistic and charming, but in form it would seem that perfection has now been attained in some of the present new varieties.



Philadelphia Rockery with display of *Cerastium tomentosum* (Snow in Summer).

The keeping quality of some roses when cut might be improved, and if without thorns will be a still greater desideratum. Improved varieties of miniature roses would also be popular, as note the late growing demand for the button, small pompom and semi-double varieties of hardy chrysanthemums that are now so popular.

The same question arises, is it possible to increase the beauty of the present new and best varieties of the peony, *Iris*, dahlia and asters?

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Work for the Month in the Garden

SAMUEL GOLDING

DURING the last few years much has been done to arouse enthusiasm for home gardens among amateurs. The War Garden movement did much to accomplish this desirable end, as it aroused popular interest in the growing of vegetables and flowers among people who were formerly content to buy their products. They discovered that it pays to produce fresh vegetables for the table, and flowers to embellish the home, with the added attraction of more beautiful home surroundings.

Many of the keenest amateurs of today commenced home gardens from a sense of duty, and now retain them for the pleasure and profit which they derive. Their gardens prove that the lesson of intensive culture has been thoroughly grasped. Some have turned their attention to flowers, specializing in one or more varieties, and their roses or dahlias show that they have become real experts in their knowledge of and cultural efficiency in their particular subject. This is one of the most encouraging signs of the future of horticulture.

With the advent of Spring, the attention of all growers is once more focused upon the garden. Vegetables of high quality will be the aim of all, which can only be attained by a thorough system of cultivation, that is, by deep digging or plowing, and the constant use of the cultivator during the growing season with the judicious use of fertilizer.

As soon as the frost is out of the ground and conditions will permit, lose no time in manuring and digging, or plowing, where it was not done in the Fall. Deep digging is a most valuable asset to future operations. If the manure is of a strawy nature, it must be placed, as deep as possible, so that it will not become exposed when preparing for sowing or planting crops. Light, sandy soils are the best for early crops, as they do not retain the moisture in the same degree as heavy soils, and in gardens of this description, early crops of peas, and spinach can be sown as soon as the ground is fit, that is, when it is in a friable condition, and can be easily worked.

For the first crop of peas it is advisable to plant the round seeded varieties because they withstand any possible wet spells better than the wrinkled or marrowfat, which though superior in quality, are not quite so hardy, and the seed is prone to rot should April prove wet and cold. Where space is limited it is a good plan to sow the peas in rows wide enough to admit the sowing of spinach between. This crop will be over just before the peas are ready to be picked.

Plant onion sets. Sow onion seeds and parsnip, and any other hardy vegetables towards the end of the month. Prepare the asparagus bed by forking in well-rotted manure, or a good dressing of bone meal, which should be done with care to avoid breaking many surface roots. Cover strawy manure over rhubarb crowns.

Close attention should be paid to vegetables growing in the pits and frames regarding ventilation and cultivation between the rows, thinning out plants that are too thick. Endeavor to conserve the sun heat by closing as soon as possible in the afternoons, and also try to maintain perfect successions.

Many of the seedlings sown last month will require transplanting, and should be pricked off as soon as they can be handled. After they have been transplanted, they

should be kept close and shaded from bright sunshine for a few days, until root action has commenced. Then gradually harden off as they become well established.

Sow more cabbage, cauliflower, Brussels sprouts, also a full line of tomatoes, egg plant, peppers, celery and lettuce for planting out later on.

Allow no time to be lost in getting any arrears of pruning done on bush fruits, cutting back red currant and gooseberry bushes to a few eyes near the fruiting wood. Remove old wood from black currant bushes. Raspberries that have been covered will need attention. Tie up in position after removing the litter and weak canes, cutting back and thinning as desired. Give them a mulch of manure. Remove the covering from strawberry beds, although it is wise to leave a mulch for some protection for a time around the crowns.

Annuals that are needed for bedding and for cut flowers should be sown this month, but the sowing of some varieties must be influenced by whatever time the flowers are needed. If wanted in September or during the Fall it is better to defer their sowing until the end of April or early in May, when they should be sown outside. This refers to such subjects as asters, zinnias, nemesias, marigolds, etc.

Celosia plumosa in its various colors have become deservedly popular as a bedding plant, its lasting value and bright plumes are a real asset to the garden.

Another plant that is worth attention is the *Hunne-mannia fumariacifolia*, which when associated with *Salvia patens*, makes a pleasing combination in the garden or border. *Brodiaea speciosa* can be recommended for its free and continuous blooming. It must be sown early.

Early flowering or border chrysanthemums deserve more attention than is usually afforded them. The merits of these plants are gaining more recognition each year, for they are almost indispensable during the month of October, as cut flowers; and do much to make the herbaceous border attractive at a season when the majority of flowering plants has ceased to bloom. Although hardy in some locations, it is a wise precaution to lift the clumps and winter in the cold frame. Where this has already been practised they will soon require some care. These flowers can be propagated by cuttings and dividing the clumps.

Remove the covering from roses as soon as the climatic conditions permit. The climbing and rambler varieties should be pruned and tied into position, though they need but little pruning in the Spring, other than cutting out any dead and weak or useless wood, providing, of course, that the old flowering wood was cut out after last year's blooming. It should be done at that time, as it encourages vigorous growth, and is conducive to a well ripened condition which will help to enable them to withstand the rigors of Winter. Where rhododendrons, box, etc., have been protected by cornstalks or straw, the protection can be taken away before the month is over.

Now is a good time to carry out work in the shrubbery where shrubs have become overgrown. The shrubs can be thinned and cut into shape, but the regular pruning season of flowering shrubs depends entirely on the character and habits of the individual plant. Spring bloom-

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Some New Shrubs for Northern Gardens

THE plants in this list are hardy in southern New England and the Middle States. The two *Rhododendrons*, however, cannot be grown in soil impregnated with lime. Several of these plants cannot, unfortunately, be found in American nurseries; they are, however, easily propagated and a demand for them will in time produce a supply. The list contains the names of eighteen of "the best" new shrubs; it might easily be increased to a hundred for there is a large number of new or little known shrubs now growing in the Arboretum which American garden-makers unfortunately neglect. The plants selected today are: *Hamamelis mollis*, *Prinsepia sinensis*, *Corylopsis Gotoana*, *Amelanchier grandiflora*, *Forsythia intermedia spectabilis*, *Cotoneaster hupehensis*, *C. racemiflora songorica*, *C. nitens*, *C. multiflora calocarpa*, *Rosa Hugonis*, *Neillia sinensis*, *Rhododendron Schlippenbachii*, *R. japonicum*, *Berberis Verna*, *Syringa Sweginzowii*, *Spiraea Veitchii*, *Philadelphus purpurescens*, and *Euonymus planipes*.

Like the other Witch Hazels of eastern Asia, *Hamamelis mollis* blooms in the Winter and the flowers are not injured by the severe cold to which they are subjected in the Arboretum. This plant has handsome foliage and larger and more brightly colored flowers than the other Witch Hazels, and is invaluable for the decoration of Winter gardens. *Prinsepia sinensis* is considered here the best shrub the Arboretum has obtained from Manchuria. It is valuable for its perfect hardiness, the fact that its dark green leaves unfold before those of any other shrub in the Arboretum, with the exception of those of a few Willows, and for its innumerable clear yellow flowers which open before the leaves are fully grown. The stems of this shrub are armed with stout spines and it should make a good hedge plant. *Corylopsis*, which is an Asiatic genus related to the Witch Hazels, has handsome yellow, early Spring flowers in drooping clusters which appear before the leaves. There are several Japanese and Chinese species in the Arboretum but only the Japanese *C. Gotoana* has been uninjured here by the cold of recent years, and it is the only species which can be depended on to flower every year in a Massachusetts garden. The *Forsythia* of the list is still the handsomest of varieties of *F. intermedia* which is the general name of the hybrids between *F. suspensa Fortunei* and *F. viridis*. This variety was raised in a German nursery and is the handsomest of all the *Forsythias* now known in gardens. *Amelanchier grandiflora* is believed to be a hybrid between the two arborescent species of the eastern United States, *A. canadensis* and *A. laevis*, and is by far the handsomest of the *Amelanchiers* in the large Arboretum collection of these plants. It came here from Europe but what is believed to be the same hybrid has been found in several places in the eastern states. The four *Cotoneasters* in the list are perhaps the handsomest of the twenty odd species introduced by Wilson from western China. They are all large shrubs of graceful habit, and have white flowers and red fruits with the exception of *G. nitens* which has red flowers and black fruit. In recent years the Arboretum has made few more important introductions for American gardens than the Chinese *Cotoneasters*. Although no longer a "new plant" *Rosa Hugonis* is included in this list because it is not only the handsomest of the Roses discovered in China during the last quarter of a century, but in the judgment of many persons it is the most beautiful of all Roses with single flowers. Fortunately for American garden-makers

the value of this Rose is appreciated by a few American nurserymen from whom it can now be obtained. The introduction of *Neillia sinensis* made it possible to add to the Arboretum collection a representative of a genus of the Rose Family which had not before been cultivated in the Arboretum. There are now other species of *Neillia* grown here but some of them are not entirely hardy, and others have no particular value as garden plants. *Neillia sinensis*, however, has never been injured by cold, and with its drooping clusters of pink flowers is a handsome plant well worth a place in any garden. *Rhododendron (Azalea) Schlippenbachii* is one of the most important introductions of recent years. A native of northern Korea, it grows further north and in a colder country than any other *Azalea*, with the exception of the *Rhodora*, and there can be little doubt that it can be grown successfully in the open ground much further north in the eastern United States than any of the other Asiatic *Azaleas*. It may be expected, too, to prove hardy further north than the American species with the exception of *Rhodora*. The large pale pink flowers of this *Azalea*, although less showy than those of a few of the other species, are more delicately beautiful than those of any of the *Azaleas* which have proved hardy in the Arboretum. There are a few plants of this *Azalea* large enough to flower in the United States, and many seedlings have been raised here and in Europe during the last two years. Until these are large enough to flower it will probably remain extremely rare. *Rhododendron (Azalea) japonicum* cannot be called a new plant for it has been growing in the Arboretum since 1893, but it is such a valuable plant and is still so little known or understood that it can perhaps properly find a place in a list like this. The large, orange or flame-colored flowers make it when in bloom one of the showiest of all hardy *Azaleas*. *Berberis Verna* has been mentioned in a recent number of these Bulletins; and it is only necessary to repeat what has already been said about it, that it is a hardy plant of exceptionally graceful habit among *Barberies*, with arching and drooping branches from which hang innumerable slender clusters of small yellow flowers followed by small red fruits. *Berberis Verna* has proved the handsomest of the large number of *Barberies* with deciduous leaves found by Wilson in western China. Among the numerous species of *Lilacs* introduced into gardens from China during recent years *Syringa Sweginzowii* is considered the most beautiful by many persons. It is a tall shrub with slender erect stems which produce every year great quantities of pale rose-colored, fragrant flowers in long rather narrow clusters. It has the merit of being almost the last of the *Lilacs* in the Arboretum collection to bloom. *Spiraea Veitchii* has the merit, too, of being the last of the white-flowered *Spiraeas* to flower. It is a shrub already 6 or 8 feet tall in the Arboretum, with numerous slender stems and gracefully arching branches which about the first of July are covered from end to end with broad flower-clusters raised on slender erect stems. This *Spiraea* is one of the best of the hardy shrubs discovered by Wilson in western China, and by many persons it is considered the handsomest of the genus as it is now represented in the Arboretum. *Euonymus planipes* is a native of northern Japan and a large shrub with large dark green leaves and the inconspicuous flowers of the genus; and it is only on account of the beauty of its fruit that this plant is included in this list, for the fruit which hangs gracefully on long slender stems is large, crimson, very lustrous and more showy than that of any of the other Burning Bushes in the Arboretum.—*Arnold Arboretum Bulletin*.

Plant Partnerships

WILLARD N. CLUTE

THE ordinary green plant is an independent individual; given only light, warmth, air and a small amount of water, it is able to make for itself all the long list of starches, sugars, proteins, alkaloids, acids, gums, tannins and other products of the vegetable kingdom. A considerable number of plants, however, have abandoned such an existence in favor of partnerships—sometimes with other plants, sometimes with insects and sometimes with other animals—apparently for the express purpose of advancing the interests of each. To such an association the term of *symbiosis* is given.

There are a great many one-sided associations of plants in Nature in which one species thrives at the expense of the other, as in the case of the mistletoe, the dodder and other parasites, and their hosts. Some students would class these also as examples of symbiosis, calling it an antagonistic symbiosis, but this seems stretching the definition a trifle. In still other cases two species may be almost constantly associated, and yet neither derive any special benefit from the presence of the other, their occurrence together being explained by the fact that they obtain their food in essentially the same places. The mosses that grow on trees are good instances. Such associations, especially among animals, are sometimes known as *commensalism*.

The most remarkable instances of symbiosis to be found in Nature are the organisms known as lichens. In these the association is so intimate that what is essentially a new type of plant is produced. Up to comparatively recent times lichens were thought to be distinct species; now they are known to consist of a fungus and an alga in partnership. The lichens themselves are familiar to all as the grayish-green, scaly or tufted growths on the trunks of trees, old fences, stone walls and in other places where the soil is too thin to support other forms of vegetation.

In the places where lichens grow there is usually moisture only for short periods. Certain kinds of algae can live in such places, but they must remain dormant when the water supply runs short. By combining with a fungus, however, the latter can absorb and hold the water for a considerable time, and thus the algae can continue to vegetate. In return for this storage of water, by the fungus, the algae provided it with food. In this way both partners can thrive in a locality where either would find it difficult to exist alone.

It is not at all likely that this partnership is voluntary on the part of the algae. It has been shown that these plants are held in a sort of bondage by the fungus, and when removed from the lichen and cultivated by themselves, are able to grow vigorously. The fungus, treated in this manner, must, of course, die for want of food. It must be said, however, that the algae in the lichen seem in no way harmed by the partnership and carry on existence much as they do when free, possibly finding the protection of the fungus of some advantage. The idea that the algae are in a sort of captivity arises from the fact that new lichens can be made artificially by bringing germinating fungus spores into contact with free algae cells. The fungus threads soon surround the algae.

An interesting illustration of the water absorbing powers of the lichen is seen in the reindeer-moss, a common form in sand barrens and other sterile soils. On a sunny day the lichen is so brittle that it crumbles almost at a touch, but as evening approaches it gathers moisture

from the air and becomes as soft and flexible as velvet. It thus forms a very dependable natural hygrometer, by which one can judge of the amount of moisture in the air. For some time after the sun has risen the lichen continues moist and flourishing, and the algae, of course, are able to continue food making.

The association of the legumes or pod-bearing plants with the smallest of living things, the bacteria, is regarded as another form of symbiosis. In this the bacteria form nodules on the roots of the host plant in which they fix atmospheric nitrogen in a form that the legume can use, receiving in return carbohydrates manufactured by their host. In this way the legumes, like the algae and fungi in the lichen, can live in places from which they would otherwise be barred. They are thus frequent in sandy and sterile soils. Having their own sources of nitrogen, they are not as dependent upon rich soils as other plants are. This explains the fact that beans may be readily grown on poor land.

Long before the Christian Era, it was known that leguminous plants, plowed under, in some way enriched the soil, but it was not until late in the last century that botanists discovered the reason for it. It is likely that through associations of this kind in past ages most of the nitrogen in the soil has been accumulated. This element does not weather out of the rocks as other soil ingredients do.

There is supposed to be only one species of bacteria that forms partnerships with legumes, but from the fact that the bacteria found on the roots of one species often will not grow on the roots of another, it is inferred that there are numerous races of the bacterium whose scientific name is *Pseudomonas radicola*. Some of these races will grow on more than one species, and others by special cultivation may be made to do so. The bacteria of sweet clover will grow on alfalfa, and that on the partridge-pea will grow on cow-peas. The special race of bacteria for each crop is transported from place to place, clinging to the seeds of the legumes, but if the soil in which legumes are planted should happen to lack bacteria the field may be inoculated with soil from a field in which a similar crop has grown recently.

Another and less well-known form of symbiosis is that in which the thready plant-body or mycelium of a fungus is associated with the roots of woody plants. This penetrates the cortex of the root at some distance behind the growing tip, and spreading out into the surrounding soil, secures nitrogenous food for the plant, acting in this way much like root hairs. Such fungi are called mycorrhizas. They are very common in bog plants, especially among the cranberries, azaleas, huckleberries and other members of the heath family, but they are also known in oaks, beeches, birches and many others. It has been suggested that possibly a majority of our trees will be found to have mycorrhizas when carefully studied. In the light of what has just been said, it is easy to understand why certain species are difficult to transplant. In digging them up we often destroy the fungal symbiont, or leave it behind when we carry away the plant. The fungi that form these partnerships with the roots of trees are not very well known, though the mycelia of the geasters, or earth stars, some of the shelf fungi, and various species of mushrooms have been identified in such combinations. Some of the ferns are also known to harbor mycorrhizas.

If we maintain our definition of symbiosis to be a partnership in which each derives some advantage from the arrangement, then the association of plants and insects, whereby the plant secures cross-pollination by providing the insects with nectar and pollen, must be set down as another case of symbiosis. Associations of this are often extremely close in some cases. In the yucca the pollinating insect actually collects pollen, and packs it down in the pollen chamber at the top of the pistil before laying her eggs in the young seed pod. Apparently the yucca flowers can not be pollinated by any other insect, and the insect cannot get along without young yucca seeds for its larvæ. The bees are remarkably adapted to their work of serving the flowers, having capacious pockets on their hind legs for carrying pollen and a crop for transporting the nectar. Though working entirely for themselves, they, nevertheless, benefit the plant. A large number of bees seem adjusted to single kinds of flowers, and are found on the wing only during the blooming season of their favorite blossoms. Orchids are often adjusted to the visits of a single species of insect, and when for any reason this particular insect is absent they set no seeds.

Instances of ant and plant partnerships are common in our gardens. The peony is frequented during the blooming season by large black ants intent on getting the nectar so abundantly produced by the sepals. Since these ants are notoriously pugnacious it is possible that they may

protect the plants from other insects. The little partridge-pea has tiny saucers on its petioles into which oozes nectar from a small opening in the center that is equally pleasing to ants. Some tropical species of legumes have hollow thorns inhabited by multitudes of stinging ants which swarm out to repel the invader whenever the plant is disturbed. It was once believed that the plants maintained the ants as a body-guard, producing little edible bodies on the leaves for their use, but a well-known naturalist has given it as his opinion that the ants are no more necessary to the plants than fleas are to a dog. Some of the tropical ferns also keep ants, or at least the ants inhabit chambers in their rootstocks, and, in a measure, guard the plant. Species which harbor ants in this way are called myrmecophilous plants.

A familiar form of symbiosis is found in such plants as produce edible fruits. These fruits are designed to be carried away by birds and other animals, and thus the seeds are distributed. Both the plant and the animal, of course, derive benefit from the transaction. But at this point we begin to depart from instances of true symbiosis and arrive at a stage where the association is not close enough to be dignified by the name. Many such will doubtless come to mind. Even man has found symbiosis useful at times; for instance, taking the horse to work for his board, and providing the cow with daily food and shelter in return for certain constant supplies of milk and butter.

March Birds

PAUL B. RIIŚ

The note of the first bluebird in the air answers to the purling rill of the melted snow beneath.

It is evidently soft and soothing and as surely as the thermometer indicates a higher temperature,

It is the accent of the south wind, its vernacular.—*Thorau.*

THE bluebird's note of pure gladness, that messenger of Springtime, is carried to us on a balmy air. How its sweet warble challenges the lingering northwind, robbing it of its paralyzing sting! King Boreas is grudgingly giving ground to the gentle awakening of life's dormant impulses; the balm of flooding sunlight reaching deep into the shadowy depths of the forests. Again we may live through Nature's childhood and take new delight in its simple gifts growing richer from day to day.

The bluebird, "shifting its light load of song from post to post along the cheerless fence," greets our arrival at the selfsame spring-brook, which daringly tempted our mettle in January. The snow is lying in patches where the protecting shadows of woodland and forest fall densest. How barren and hopeless it seemed two months ago. But what a subtle change has taken place. The boisterous brook, unrestrained by the icy hand of Boreas, is violently tumbling down its winding course. The kingfisher, our old acquaintance, greets us with a vigorous challenge of assurance, while a number of robins are enjoying an early bath in the crystal waters with all the abandon of Springtime. A little later we meet them again in a friendly sumach thicket in company with the bluebird partaking of a frugal meal, deftly plucking the seeds from the velvety depth of sumach bobs. There too in silent approbation, now at rest, now flitting from limb to limb, we meet our avian friend Chesterfield, the cedar waxwing, gathering the spare seeds of the hackberry. They are immaculately clad in gray and olive and their red insignia completes the harmonious touch

of correctness. Politeness forbids to take note of the intruder and their pantomime suffers little from our attention.

Like the streams in Springtime, the stream of migration is gathering volume. Leisurely we observe a rough-legged hawk patrolling the valley in spiral flight unhurried and confident, while the not unmusical note of the bronzed grackle breaks the silence. The clear liquid notes of the meadowlark from a distance proudly proclaim, "Spring of the Year. Spring of the Year." In assurance we observe the massive trunks of the elms, fed by perpetual fountains of springs. Rising like the pillars of Hercules, their fibres are again surging with the stream of life; the swelling buds glistening in the brilliant sunshine.

The blue jay, noisily protesting our advance is joining in the flock and presently we listen to its artful pleading attempts to beguile a mate. The flocks of tree sparrows have grown abundant, "their erstwhile tinkling notes, like sparkling frost crystals," now transformed into a sweet canary-like warble.

Slate colored juncos are flitting across our path, their twittering trill mingled with the phe-be call of the chickadee. And yet, in the abundance of early Springtime we hear strains of surpassing beauty, a well modulated, carefree warble, the song of the purple finch. The rich outpouring of a yearning heart, incomparable and matchless finds little rivalry among the songsters at any time. And later in the month, how one's heart bleeds for these early arrivals, misled with the homing instinct strong within. March in its proverbial madness is but fitfully generous. The golden days of sunshine have yielded to sleet and snow. Again the hills are windswept and the meadows, valleys and woodlands become strangely silent. The carol of the robin, the endearing warble of

(Continued on page 512)

The Dahlia—the Flower of Myriad Forms and Shades

EDWARD C. VICK

IT is safe to say that no other plant suited to so many different soils and locations, so easy for the amateur and professional gardener to grow, and to be obtained at so small a cost, equals the Dahlia on these

hybridizers in New England, New York, New Jersey, Indiana, Colorado, California, Oregon and other states constantly bringing out new varieties, to say nothing of the older producers in Great Britain, Holland, France and Germany.

The impression is erroneous that the many double-flowered Dahlias are forms created by modern horticulturists from the single-flowered type, *Dahlia variabilis*. W. E.



Field Marshal, Hybrid Cactus, a splendid primrose yellow, a European production. Henry A. Dreer.

points. And seemingly there is no end. New forms are constantly appearing and there are so many now that there is no record, no knowing, how many different varieties there are.

There is one grower who has over fifteen hundred varieties, and not far from him is another having more than one thousand. Neither has two hundred varieties alike, and in these two gardens are possibly two thousand different varieties. In addition, there are numerous other



Jean Kerr, Decorative, an early and sure bloomer, short petaled type, pure white. W. Atlee Burpee Company.

Safford, Bureau of Plant Industry, U. S. Department of Agriculture, who has devoted considerable time to the study of the Dahlia, is authority for the statement that in the earlier illustrations of plants belonging to this genus, made more than three and a half centuries ago, only double-flowered forms are represented. Cavanilles, in his work on the plants discovered by the Spanish navigators, based the genus on *Dahlia pinnata*, a plant with double heads and identical in form with certain Peony-flowered Dahlias of modern catalogs.

Francisco Hernandez, the protomedico of Philip II, sent by his sovereign in 1570 to New Spain to study its re-



Scorpion, Incurved Cactus, the narrow petals gracefully interlaced, flowers of medium size, clear yellow. J. K. Alexander.



Mignon Dahlias grow about eighteen inches high, of compact habit, producing a mass of brilliant colored flowers. Charles H. Totty Company.

sources, figured three Dahlias under the Aztec names, *Acocotli*, *Cocoxochitl* and *Acocoxochitl*, all of which are derived from *Cocotli*, signifying a hollow-stemmed plant. Two of the figures of Hernandez represent types now called duplex, and a third represents flowers of what are now called the Peony-flowered type. The author states that many more forms occur in Mexico, differing in size and color and in the shape of the flower.

At a later date, in Europe, the Dahlia was called "Georgiana," after Professor George, of St. Petersburg, which name is still used in some of the foreign catalogs. This name was later changed to Dahlia, after Mr. Andrew Dahl, a Swedish botanist, and pupil of Linnaeus.

Dahlia Juarezii, the first of the cactus form was discovered in 1872.

Dahlia Tubers were used as food in Mexico and were first sent to Europe, with the idea that the tubers, under

heavy, with a clay sub-soil, lighten it with sand or coal ashes.

In a New Jersey garden, where the soil was heavy clay, I spread coal ashes, a foot deep, over the entire surface. In turning the soil over, a garden fork was used, mixing the ashes with the soil. This was heavily fertilized with



Ada Finch, a new type, *Narcissus* flowered, outer rows of petals pure white with pale yellow center. Charles H. Totty Company.

cultivation, would be useful as food, but as neither man nor cattle relished them, horticulturists turned their attention to the flowers. Recently it has been discovered that Dahlia tubers contain a sugar valuable in medicine, and attention is now being given to growing the plant for this purpose.

A tree form of the Dahlia has been found whose top, like the stem of a tree, does not die down. What this type will develop in the interest of floriculture, remains to be seen.

Dahlias can be successfully grown wherever potatoes grow and they are quite as easy to cultivate. Always give the Dahlia an open, sunny situation. They are particularly adapted for use along the sea or lake shores on account of the heavy dews. As to the soil, they are not particular, sand, gravel, heavy or light loam being suitable. Heavy soils tend to produce plants with an abundance of foliage and few or inferior blossoms. Where the soil is



Ruth Van Fleet, Hybrid Cactus, canary yellow flowers, six to eight inches in diameter. George L. Stillman.

stable manure once. After the first year, rotted leaves were applied heavily every Spring, and lime spread, and the soil was excellent, not only for Dahlias but also for other flowering plants and vegetables.

Manure from the horse or cow stable, spread broadcast, makes good fertilizer, and chicken manure is also good; also, any commercial fertilizer rich in nitrogen, potash and phosphoric acid.



Emily D. Renwick, Decorative, rose with a golden sheen at base of petals. Mrs. Charles H. Stout.

The soil should be plowed or spaded to a depth of eight to ten inches, and twelve to fourteen inches is better. Make the drill to receive the tubers six inches deep. Plant tubers or set out plants any time in the Spring, when the soil has become warm, and the flowers will appear in six to eight weeks. The late flowers are best, appearing when the nights are cool. Never plant whole or undivided clumps, but single tubers, being sure that there is an eye or bud on each tuber. Lay the tubers flat or horizontally in the drill, with the bud or eye pointing up. If stakes are to be used, set the stake when planting, so the tuber will not be damaged forcing the stake down on it. After placing the tuber, cover it with four inches of soil, and if no other fertilizer has been used, spread from a pint to a quart of pulverized sheep manure over this, and then fill up the drill even with the surface. Never allow the fertilizer to touch the tubers.

If the garden has been fertilized before planting, use no more fertilizer. Too much fertilizer will make rank-growing plants, with few and inferior flowers.

The staking system is the most popular with amateurs. The plants are set from two to four feet apart and only one stem or main stalk permitted to grow from the root. Tie the plants to the stakes as soon as they are two feet high so the stems will have room to expand as they grow. This prevents them from being blown or knocked over and broken.

The branching system is used for field culture. The rows are usually placed about three feet apart and the plants two feet apart in the rows. When the plants have two sets of leaves, pinch out or cut off the whole top. A branch will then start at each leaf. Only pinch out the tops once, as the pinching delays flowering two weeks. The result is four flower stalks instead of one. The plant then will have a short, strong, single stalk, with four branches of flowering stalks.

The massing system consists of planting the tubers from ten inches to two feet apart.

Some varieties produce a large number of buds, more sometimes than the plant is able to develop into good-sized flowers. A proportion of the buds should be removed as soon as they appear, and those remaining will make longer, finer flowers. The more the flowers are cut, the more flowers the plants will produce.

Keep the soil well cultivated and free from weeds. When the plants begin to flower, cultivation must be discontinued, as then new roots are forming which are likely to be cut, weakening the plants.

Dahlias are rank growers, composed mostly of water. When the hot Summer days arrive, do not let the plants suffer for water. Without ample moisture in the soil, the plants are unable to produce their mass of flowers. When the flowers begin to appear is the time to apply a little additional fertilizer.

Some varieties require acclimating, and if they do not do well the first year, give them a second season's trial in the garden.

Seeds of Dahlias started in the house in March or April will produce flowering plants the same year. Most of the flowers will be single and inferior to varieties now in commerce, but it is interesting work. The seeds of the best varieties are likely to produce the best results. The classes are:

Single Dahlias, open centered, eight to twelve petals; Show or Ball shaped, the old ball shaped, full to the centre; Fancy Dahlias, Show Dahlias, with fancy stripes or spots; Hybrid Show, flowers fully double, loosely constructed (this class borders on the decorative); Pompom, Show Dahlias under two inches in diameter.

Peony-flowered, semi-double flowers, having two, three or more rows of broad, flat, loosely arranged petals, surrounding an open centre. The inner petals are usually curled or twisted, the outer more or less irregular.

Decorative, double flowers, full to the centre, flat and somewhat loosely arranged petals. The centres show sometimes in the last flowers of the season.

Cactus, flowers fully double, long, narrow, curved in or twisted petals, with sharp or fluted points and with margins rolled backward or outward, forming in the outer florets a more or less perfect tube for more than half the length of the petal. Hybrid Cactus, flowers fully double, petals short as compared with the former type, broad, flat, curved in or twisted. The tubes or outer petals less than half the length of the petal.

Duplex, semi-double flowers, which have petals more than twelve in more than one circle.

Collarette of the single type, with a circle of smaller, narrower rays, usually of a different color, in front of the longer rays, forming a collar between them and the open centre.

Anemone, one row of longer petals, like single Dahlias, surrounding a rosette of compact petals in the centre.

DAHLIAS IN THE FLOWER GARDEN

Mrs. Charles H. Stout

THE *Dahlia* is one of the few plants which will adapt itself to any and every kind of garden. A few in the back yard, or several in the large garden, or masses growing along the edge of a great lawn, all give satisfaction in their environment, and are a mass of bloom for a longer period than nearly any other kind of flower. Moreover, it is good for them to be picked, and the greater number carried into the house means more buds to open outside.

Unfortunately most people who have the modern dahlias grow them for cut flowers only, planting a heterogeneous collection in a corner of the vegetable patch or some other out of the way place. It is a pity, and I hope that more dahlias will be seen this year in flower gardens both large and small.

The colors and forms of this most beautiful flower are so varied that there are types to please any taste, whatever it may be. Some people dislike red. There are thousands of dahlias in white, yellow, orange, pink, lavender, purple, and even black—or as near black as nature will allow. There are some who prefer red. There are reds from the giant brick red *Douzon*, the blood red *Mina Burgle*, the rose red *Grampion*, the cerise red *Creation*, to the scarlet *Breeze Lawn*.

There are people who love great massive types; there are others who like the dainty "star" types, the pompoms, the collarettes or the little "Mignon," lately introduced. Then there are still others who prefer the graceful peony or cactus dahlias. Among the ten thousand named varieties represented in the official check list of the American Dahlia Society, surely there are plenty to choose from.

The dahlia is the poor man's orchid. True there are many novelties listed in the catalogues this Spring, for which the originators are asking fabulous prices; but all dahlias are so cheaply grown and increase so rapidly that it takes but a short time before the prices on these become normal—if they survive at all.

In planting dahlias in the garden let me make a few suggestions for color combinations. Try four plants of *Madonna*, and in front of these set three plants of *Hortulanus Fict*. At the feet of the latter put six plants of the *Niveus* or *Albion*. *Madonna* is sometimes classed decorative and sometimes hybrid cactus, but its graceful habit of growth is more like the peony dahlias. It is pure white, and, disbudbed, gives large and dignified blooms. *Hortulanus Fict* is stocky, a foot or two lower, and is always covered with a mass of creamy pink decorative flowers. *Niveus* and *Albion* are both mignon dahlias, growing eighteen inches high, bearing pure white single flowers. They should be planted about eighteen inches apart, and

they make a beautiful edging for almost any border. *Niveus* is more bushy than the other.

Chrystal, a fine pink incurved cactus dahlia, may be planted in the place of *Hortulanus Fict*; or for another combination, *Attraction*, the finest lavender grown, with frilled petals somewhat resembling *Madonna*, though with much more rigid stems.

For a planting of deeper tones try *George Walters*, a huge hybrid cactus of dull rose with a faint golden sheen, with *Cecelia*, a creamy yellow peony, or the *Duchess of Brunswick*, a splendid pink peony, though with not very good stems. Place *Countess of Lonsdale*, that wonderful old favorite rose colored cactus in front, and edge the bed with Sweet Alyssum or Dusty Miller.

For those who love the reds, there are *Mina Burgle*, *Kalif* or *l'alliant*, which look best with a contrasting white, such as *Mrs. Struck* or *Alavanche*. *Etna*, a scarlet mignon, may edge this bed.

The Autumn tones can be combined with *Copper* at the back, a tall peony whose name denotes the color, and *King of the Autumn*, medium apricot decorative; and edged with two mignons, *Olive* (orange), and *Pembroke* (yellow), alternately.

Another wonderful combination is *Pierrot*, an orange and yellow variegated incurved cactus, with graceful pendulous heads, and *Melody*, a pale yellow and white dahlia of the same type. They are beautiful together in the garden, and in a tall vase in the house cannot be surpassed.

Countess of Lonsdale on the small dinner table, or *Chrystal* on the large, arranged with soft foliage, are both exquisite. Occasionally rough handling will whip the head from some large dahlia. Do not throw it away, but float it on a flat dish, black, if you have one, together with a few ferns, and see what a beautiful table decoration you have. The pom-pom, *Gretchen Heine*, a dainty pink, makes a lovely centrepiece when placed in a clear glass bowl. Some of the buff and yellow pom-poms combine well with deep purple *Veronica*.

The single dahlias, *Newport Pink* or *Newport White*, combine well with a bowl of lavender *Buddelia*, and a spray or two of Maiden Hair Rue. Do not fail to place two or three blooms of *Delice* in a vase of purple heliotrope. It is worth growing the heliotrope for that alone.

St. Egwin Aster combines well with any of the pure pink dahlias, either used as a cut flower or as an edging to the bed of dahlias. If used in the garden, however, care should be exercised to keep it within bounds, as it is a rank grower, and will wage war on the dahlia roots if allowed too near.

The few named varieties I have mentioned are all standard sorts, and may be purchased for a dollar a tuber or less. There are hundreds of others, and I could make a thousand suggestions—but then, you see, I am riding a hobby.

Won't you get on and ride with me? You will then grow dahlias and more dahlias—and still more dahlias; and you will have the healthiest and happiest time of your life.

Order some now and see if I am not right.

HAS PERFECTION BEEN REACHED IN ROSES

(Continued from page 499)

Increase of size of bloom will in my judgment detract rather than improve their beauty.

Vigor of growth, freedom from disease and the lengthening of the blooming period of strictly hardy and climbing roses through continued selection and seedling, are improvements that may be hoped for.

JAMES R. PITCHER.

THE DAHLIA—THE GREATEST OF ALL FLOWERS

E. L. Kunzman

A MAJORITY of the public, if asked which is the greatest flower, will answer, the Rose, some may say the Lily, others the Sweet Pea, but few will name the Dahlia.

Why is it so? I venture to say that it is because they do not know the Dahlia of today, and have in mind those of our forefathers, the ordinary ball type of unattractive coloring and comparatively no stem. In my years of experience I have never known anyone who, on first seeing the modern Dahlia, did not exclaim with delight and pleasure—and the Dahlia deserves it.

I contend that the Dahlia of today is the greatest of all flowers, by far, and only those unacquainted with it will dispute the statement. But if you should want positive proof, grow them yourself.

The Dahlia will do well in any situation; almost any location, soil or climate, if given proper attention. This "attention" means preparing the soil thoroughly by digging or plowing it and fining or pulverizing it; planting rather late than early (after corn planting time); keeping the top soil, which must not be rich, nor too poor, loose by hoeing or otherwise.

Use water only when exceedingly dry, soaking the soil every eight or ten days, and restirring top soil next day or so.

An application of liquid manure or phosphate fertilizer when flower buds appear, and at intervals of three weeks or so will guarantee fine bloom.

Keep all old bloom off the plants (the more you cut from the Dahlia, the better it blooms).

What other flowers will do well in any kind of soil? None.

Also, the Dahlia has the widest variation in size, color and shape of any flower. We have the tiny Pompom, the old-fashioned Show or Ball type, the later Cactus; decorative; Peony, flowered; Collarette, Anemone and Century or Single types, some attaining huge proportions, many so beautiful it is impossible to do them justice in any description. No matter what flower we think of, there is some variety of Dahlia closely resembling it in shape.

What are the other points of superiority?

They are the most inexpensive; for, when roots are once bought, we always have the stock, and an increasing quantity, if care is taken in Winter storage. An ordinary cellar is the best.

The Dahlias have a longer continuous blooming period than any flower. They produce far more bloom to the given area than any other. The more one knows of the Dahlia, the more alluring it is.

Now, I wonder why, in view of the foregoing facts, the Dahlia is so little known? Is it because its rise in greatness has been so swift, or is it because we who do know it, let our love for it become so self-absorbed we do not think of advertising its beauties and virtues?

Let us, who are acquainted with this fascinating flower, decide to give it at least a small portion of its due and proclaim its many good points wherever chance offers.

If the modern Dahlia were as well known and advertised as the Rose, for instance, there would be no comparison between it and others in popularity, and the lives of millions would be made happier thereby.

Our helm is given up to a better guidance than our own; the course of events is quite too strong for any helmsman, and our little wherry is taken in tow by the ship of the great Admiral which knows the way, and has the force to draw men and states and planets to their good.—Emerson.

Bog and Water Gardens

HERBERT DURAND

IN the February GARDENERS' CHRONICLE, under the title "Essentials to Success with Wild Gardens," I gave four lists of native evergreens, shrubs, ferns and wild flowers. These were grouped according to habitat, and accompanied by a brief description of the conditions of soil, moisture and exposure under which the plants of each group will ordinarily flourish. Group 1 was of plants growing naturally in moist shade; Group 2 of plants growing in moist sun; Group 3 of those flourishing in dry shade, and Group 4 those which prefer dry sun.

In the present article Group 5, including aquatic and semi-aquatic plants, and Group 6, composed of general purpose plants from all groups, are described.

Group 5—Plants Growing Naturally in Bog or Swamp Soil—In a bog, properly speaking, the soil is a mixture of muck, twigs, decaying leaves, etc., and there is no drainage; in a swamp or marsh there is usually free drainage. Thus the margin of a bog is generally a marsh or swamp which drains into the bog. These conditions may be imitated artificially, both as to soil and drainage, or lack of drainage, by constructing a water-tight tank in the midst of a marshy area. In a bog garden many very choice and interesting plants may be grown that will not thrive in any other location. This is also true as regards the swampy margin, or any marshy area.

Conifers—White Cedar (*Thuja occidentalis*)

Broad-leaved Evergreens—Swamp Azalea (*A. viscosa*); Rhodora (*R. canadensis*); Sheep Laurel (*Kalmia angustifolia*); Pale Laurel (*Kalmia glauca*); Leather-leaf (*Cassandra calyculata*); Labrador Tea (*Ledum groenlandicum*); Wild Rosemary (*Andromeda polifolia*).

Deciduous Shrubs—The Willows (*Salix* var.); Spice Bush (*Lindera benzoin*); Black Alder (*Ilex verticillata*); Button Bush (*Cephalanthus occidentalis*); Sweet Gale (*Myrica Gale*), and High Bush Blueberry (*Vaccinium corymbosum*).

Ferns—All the Osmundas, the Crested Fern (*Aspidium cristatum*); The Marsh Fern (*Aspidium thelypteris*); The Sensitive Fern (*Onoclea sensibilis*), and both Woodwardias (*W. angustifolia* and *W. Virginica*).

Wild Flowers—Wild Calla (*C. palustris*); Marsh Marigold (*Caltha palustris*); Swamp Milk Weed (*Asclepias incarnata*); Purple Potentilla (*P. palustris*); Golden Club (*Orontium aquaticum*); Buck Bean, (*Menyanthes trifoliata*); the pitcher plants, (*Sarracenia* var.); The Stud-flower (*Helonias bullata*); The Sea Pinks (*Sabatias*); The Indian Pink (*Calopogon pulchellus*); The White Fringed Orchid (*Habenaria blephariglottis*); *Arethusa bulbosa*; *Pogonia ophioglossoides*; The Sun Dews (*Drosera*); Venus' Fly-trap (*Dionaea muscipula*); The Yellow Flag (*Iris pseudacorus*), and the American Cranberry (*Vaccinium macrocarpum*).

Water Plants—The Pond Lily (*Nymphaea odorata* and vars.); Pickerel Weed, (*Pontederia cordata*); Water Shield (*Brasenia peltata*); Floating Heart (*Limnanthemum lacunosum*), and Water Arum (*Peltandra Virginica*).

Group 6—General Purpose Plants—Under this heading are included those plants which seem to adapt themselves to most any soil, and are apparently indifferent as regards moisture and exposure. Many of them have proved welcome additions to the hardly perennial border, and these are listed in the catalogs of most nurserymen and seedsmen.

Coniferous Evergreens—Red Cedar (*Juniperus Virginiana* and vars.); White Cedar (*Thuja occidentalis* and vars.); White Pine (*Pinus strobus*); White Spruce (*Picea alba*); Hemlock (*Esuga canadensis* and *T. Carolinianum*).

Broad-leaved Evergreens—*Rhododendrons Carolinianum* and *Kalmia latifolia*, provided there is not too much lime in the soil.

Deciduous Shrubs—*Azalea arborescens*, *A. nudiflorum*, *A. calendulacea*, *A. vaseyi*, and practically all the shrubs listed in Groups 1 to 4.

Ferns—Evergreen Wood Fern (*Aspidium marginale*), under shrubs: Lady Fern, (*Asplenium felix-famina*); Hay-scented Fern (*Dicksonia punctilobula*); Interrupted Fern (*Osmunda claytoniana*); Broad Beech Fern (*Phegopteris hexagonoptera*); Bracken (*Pteris aquilina*); Rusty Woodsia (*W. ilvensis*).

Wild Flowers—Colic Root (*Aletris farinosa*); Columbine (*Aquilegia canadensis*); Orange Butterfly Weed (*Asclepias tuberosa*); Aster (*A. cordifolia*, *A. ericoides*, *A. laevis*, *A. Nova-Angeliae*, *A. Novi-Belgii*); False Indigo (*Baptisia tinctoria*); Boltonia (*B. asteroides* and *B. latifolia*); Harebell (*Campanula rotundifolia*); Golden Aster (*Chrysopsis mariana*); Bristled Aster (*Diplopappus linariifolius*); Shooting Star (*Dodecatheon meadia*); White Snake Root (*Eupatorium ageratoides*); Flowering Spurge (*Euphorbia corollata*); Sneezewort (*Helenium autumnale*); Swamp Rose Mallow (*Hibiscus moscheutos*); Red Wood Lily (*L. Philadelphicum*); Meadow Lily (*L. canadense*); Turk's Cap Lily (*L. superbum*); Cardinal Flower (*Lobelia cardinalis*); Great Blue Lobelia (*L. syphilitica*); Wild Lupin (*L. perennis* and vars.); Virginia Cowslip (*Mertensia Virginica*); Bee Balm (*Monarda didyma*); Phlox (*P. amara*, *P. divaricata*, *P. subulata* and vars.); Obedient Plant (*Physostegia Virginiana*); Golden Rod (*Solidago casia*, *S. canadensis*, *S. nemoralis*, *S. Spectabile*); Cornflower-Aster (*Stokesia cyanea* and vars.); Meadow Rue (*Thalictrum cornuti*); Celandine Poppy (*Stylophorum diphyllum*); Spiderwort (*Tradescantia Virginica*); Bird's Foot Violet (*Viola pedata* and var. *bicolor*); Wild Roses (*Rosa blanda*, *R. lucida* and *R. setigera*); Virginia Creeper (*Ampelopsis quinquefolia*); Bitter Sweet (*Celastrus scandens*); Virgin's Bower (*Clematis Virginiana*).

NOTE.—The lists of plants given in the various groups is by no means complete. My idea has been to name those of conspicuous beauty, which do well under the conditions prescribed, with ordinary attention to their requirements.

We all need to break the grip of earthly things. It is wholesome to escape if only for an hour from the routine and tyranny of the daily task. We are sons and daughters of the Eternal, and our life has sovereign joy and power only when we are in tune with the Infinite. Oliver Wendell Holmes used to say that he attended church because he desired to water every week the delicate little plant in his soul named reverence. For the development of our interior life we need the ministry of the sanctuary.

We need to come into communion with our fellows in the search after the best things.—Rev. C. E. Jefferson.

All things are not right in the country today nor will they be right until we as individuals try to make them right.

Ornamental Tree Pruning an Art

THERE are few ornamental trees or shrubs that do not require occasional pruning or trimming at one season or another for their best growth and development. The extent of this, with certain exceptions,

able pruning is often needed the first few years after planting, on account of excessive growth induced through climatic conditions, cultivation, enriched soil or extra water supply. This growth commonly manifests itself

in water sprouts, overdevelopment of the head causing top-heaviness and leaning, or in extra growth in occasional vigorous branches in one part of the plant or another, all of which tend to destroy the otherwise natural form of symmetry of the tree, unless corrected by careful pruning.

The much-planted and justly popular pepper tree is a notable example of the above, due partly to its soft, yielding wood. On this account, during its first years, cutting back and thinning out of the crown are necessary, in addition, to secure bracing of the trunk.

It is justifiable at times to resort to topping in the case of shade trees to induce a denser growth, or where trees have become too tall to be in harmony with their surroundings. Such pruning, however, should be done with deliberation as to effects desired. Dead or unhealthy branches or those broken by storms should be removed speedily, and if necessary the remaining top or crown



This tree, an English white oak on the estate of Mrs. Sidney Webster, Newport, R. I., broke down some years back in a high wind storm about eight feet from the ground, its several limbs spreading out in different directions as shown. These limbs upon instructions from the gardener were supported by iron arms and the shrub-like looking specimen shown in the picture. At the time I had this picture taken the acorns were on this tree in abundance. It is still possible by treating the decayed parts to preserve this wonderful specimen tree. Arthur M. Horn.

however, is often quite limited, and in this respect ornamental plants differ from fruit trees. Pruning is usually given too little attention by the amateur planter and homemaker, with the result that the task is put off as long as possible to be finally disposed of with little or no forethought and regardless of results.

All newly set trees should have their branches cut back to correspond with the loss of roots incident to transplanting, though this does not mean that such trees are to be reduced to poles. At planting time all mutilated parts of roots should be removed, and if the trees are of considerable size, *i. e.*, eight feet or so high, the main limbs should be put back to within twelve or fourteen inches of the trunk, the leader being retained.

A sufficient number of branches, varying with the kind of tree, is left to form the framework of the crown. These should be disposed at nearly equal angles about the trunk and not lie in the same horizontal plane. If handled in this manner, such trees as the ash, locust, mulberry, cottonwood and sycamore will need little further attention for some years and will usually develop into pleasing, symmetrical forms.

When small trees are used, consider-



To an untrained eye the crotch of this neglected forked maple tree appeared to be perfectly safe for, as will be seen, very little decay is noticeable. In this tree as in all V shape crotch trees, it is necessary to support the crotch against high winds and side strains, by the use of cables and bracing. These braces are most important; and should not be inserted in any slipshod way, otherwise more damage than good will be the result. A man skilled in the work will insert these cables and braces in quick order, and at the same time, insure the natural sway of the limbs, and the proper flow of sap and the healing over of any wounds. The picture shown plainly denotes a beautiful specimen tree with one side entirely ruined. Arthur M. Horn.

reduced sufficiently to insure reasonable uniformity later.

Slow-growing or unhealthy trees are often encouraged to make vigorous growth by judicious pruning, in connection, of course, with other proper care. Open-headed trees may be made to grow more compact by heading in, while a gradual thinning out of the inner branches corrects trees with too dense or compact heads. Likewise, those that are nonsymmetrical can be worked into symmetrical trees by removing the abnormal parts, though such treatment is most effective in the earlier training of the plant.

As trees get older it becomes necessary to cut out some of the inner branches to open up the crown, thereby overcoming a crowded or brushy appearance, and to provide for continued symmetrical development of the tree as a whole. The numerous dead limbs in the centers of even healthy trees are excellent witness to this fact.

In all cases the cutting should be done close up to the trunk or branches and parallel to the surface of the bark, and the cut should be left smooth. Decaying projecting spurs are not only unsightly in themselves, but also retard healing over, and form excellent lodgment for fungous diseases. Hollow trunks commonly result from neglect of this character.

The above is particularly true in the case of large branches, the removal of which leaves wounds of some considerable size. Late Winter or early Spring pruning is best for all ordinary purposes, as it induces an extra growth of wood the following season, which is always desirable with ornamentals.

Large branches should not be removed just previous to nor during the period of the most rapid growth of the tree, as serious bleeding may result; neither should they be cut off in the late Summer or Fall, since a considerable period must elapse before healing over of the wound can take place.

In the removal of such limbs it is best to make two cuts, the first one eighteen or twenty inches above the point where the final one is to be made. In this way danger from tearing the bark or otherwise damaging the trunk is overcome. After the first cut has been completed, which removes most of the weight of the limb, the final one can be made with ease and accuracy.

Cutting first on the under side and then on the upper side of a large limb will usually secure the same result, though it is less certain. A heavy coat of thick lead paint, preferably of the color of the bark, should be applied to all wounds an inch or more in diameter. This not only improves appearances, but also renders such surfaces immune to fungous attacks and checking by weather.

Where one has but a few trees to attend it is possible to handle them so as to make necessary the removal of only small limbs or sprouts and the occasional pinching back of a branch that has outdone its neighbors. Trees cared for in this way are more uniform and symmetrical in their development and make more rapid progress than others.

In the case of trees or shrubs grown principally for flowers, those blossoming early in the Spring season, like the locust, lilac, *laurustinus* and flowering quince, should not be topped or pruned until after flowering time, since such cutting would remove most of their blossom buds. On the other hand, those that flower late in the Summer, as *hibiscus*, virgin's bower or *clematis* and elder, should be pruned at the usual time, *i. e.*, in the early Spring, since the blossoms of such species almost invariably develop on twigs of the same season's growth, and pruning at this time increases the number of these twigs.

In the pruning of ornamental plants in general, perhaps the most important consideration to be kept in mind is that of allowing the natural or characteristic shape of

the variety of tree in question to assert itself, for the beauty of a particular plant lies in its individuality and distinctness from other plants. Of what consequence is it to set different varieties of plants about one's home and then proceed to make them look as much alike as possible by hard and fast cutting? In the case of trees of the same species, one should select an ideal or typical specimen and prune the others toward that end.

Ornamental pruning, therefore, should be directive or constructive rather than destructive. Trees like the Lombardy poplar or Italian cypress, that grow naturally upright, should be encouraged in that habit; while those with graceful, spreading forms, like the pepper, should not be forced into artificial shapes by severe and continuous trimming and shearing, for all such attempts are certain to result in the end in esthetic failure.

Likewise, one should not expect to make a tree out of a shrub, nor the reverse. In the extensive and interesting grounds at Del Monte, Cal., trees of most diverse forms and habits have had their individualities preserved to a remarkable extent by intelligent pruning, and this in spite of the fact that it was often necessary to do heavy cutting among the indigenous trees already growing on the grounds. In many instances one-fourth to one-third of a tree has been cut away without changing perceptibly its appearance or that of the surroundings, so skillfully was the work done.

With coniferous evergreens such as cedars, cypresses, spruces and pines little pruning is needed at any stage of their growth. The limbs of the trunk should be left intact from the ground up, so as not to destroy the symmetry of the tree. Likewise, the central stem or leader should not be touched, and if by accident the terminal bud is destroyed, the most promising branch of the nearest lower whorl should be tied erect to take its place and the remaining laterals of this whorl cut back or removed entirely to make certain of its development into a leader.

The occasional cutting back of limbs of evergreens should be done in the Spring, since pruning at this season induces extra growth and also encourages the development of new buds for further growth at the cut ends. Occasional lateral branches that make an extra strong growth may have their soft wood pinched back during mid-Summer to preserve uniformity, or if this is not enough, they may be cut back in the Spring to a strong bud.

Evergreens should never be trimmed in the Fall, and older wood should not be cut.

Shrubs like the oleander, privet and myrtle require pruning to remove dead or unhealthy growth, thin out and cut back the stems, overcome occasional straggly habits and also to keep them within reasonable bounds in relation to their surroundings. They should be trimmed so as to have an easy and natural appearance, rather than a strict or artificial one. Ordinarily, they appear best when only the branches lying next to the ground have been removed.

With roses the stems should be shortened one-third to one-half. There is endless discussion concerning this, however, due in part to different conditions. The gardener's rule is to cut back the weak growing varieties severely and the stronger ones less. In general, heavy pruning among roses encourages more vigorous growth, with few and finer flowers, while the opposite treatment results in more flowers, which are, of course, smaller and shorter-stemmed.

Vigorous growing vines, like the native Virginia creeper and the Arizona grape, may have virtually all the secondary growth cut away during the dormant season, as this dies of itself sooner or later, thus forming lodging for dust, insects and sparrow nests.—*The Countryman*.

Walks and Talks Among the Spring Flowers

FLORUM AMATOR

WE will resume our garden walks and talks where we stopped in mid-April. We may not walk and talk in a very orderly manner, but we will try to have a pleasant time together. The birds are coming north again. The buds on shrub and tree are swelling. All Nature is fast awakening out of her Winter sleep.

Here are more Anemones, the dainty Wood Anemone, *Anemone nemorosa*, under the trees, with solitary flowers, white, pink and purple, held on slender stems well above their delicate foliage; near it the Snowdrop Windflower, *Anemone sylvestris*, whose large, nodding, sweet scented flowers appear singly or in pairs; not far away we see its double form, *A. sylvestris flore pleno*, and another species, the Narcissus Flowered Anemone, quite different from the others, whose white, yellow-centered flowers are in umbels and held well above the deeply divided leaves.

There is an interesting, dainty plant, the large-flowered Barrenwort, *Epimedium macranthum*, the inner sepals of its white flowers are violet, its outer bright red, its spurs are white, and even its new foliage has a reddish tint. This plant thrives in the half-shade in the border or rock-garden. Near to it is its variety, the large white-flowered Barrenwort, *E. macranthum niveum*, whose oddly formed flowers are white.

In this Rhododendron bed we see the Dogtooth Violet, *Erythronium*, several species, *E. albidum*, whose solitary white flowers with a yellow base surmount a stem rising between narrow leaves which spring up from a bulb; *E. Americanum*, with yellow, drooping, liliaceous flowers, and mottled leaves; *E. citrinum*, whose broader petaled yellow flowers, tipped with pink are borne one to three to each stem above mottled leaves; *E. grandiflorum* with unmottled leaves, and one to six yellow flowers on each stem; and *E. dens canis*, whose dainty, solitary drooping flowers varying from white to rosy purple are raised above the reddish brown foliage. This collection of Dogtooth Violets is very interesting.

These beds of Dutch Hyacinths are a beautiful sight. The air is laden with the sweet perfume of their many bright colored single and double flowers. What a fortunate youth Hyacinth was to have such a beautiful flower named after him.

Not far away from the Hyacinths the early-flowering Tulips, double and single, are now making a brilliant display. What a range of colors they have, from white to almost black, but the red and yellow are the most showy. Hyacinths and Tulips are so familiar to all flower lovers that we will walk by them with great admiration but few words.

This bulbous plant is the striped Squill, *Puschkinia scilloides*; its white flowers borne in clusters are marked with blue. Though growing here in the border, it is equally good for a rock-garden.

Under these trees we see the Wake-Robin, *Trillium* is the botanical name, several species, the Nodding Wake-Robin, *T. cernuum*, whose lone white flower is almost hidden among the foliage; the white Wake-Robin, *T. erectum album*, with charming white flowers raised above its broad foliage on graceful stems; the Early Wake-Robin, *T. nivale*, a dwarf, whose solitary cream-white flowers are carried, some on erect, and others on drooping stalks; the Painted Wake-Robin, *T. undulatum*, the handsomest of all Wake-Robins, whose large white

flowers are marked with crimson; the Ill-Scented Wake-Robin, *T. erectum*, whose graceful stems springing from dark, broad foliage, are surmounted by charming brownish red flowers. All of these Wake-Robins are excellent for naturalizing among hardy ferns or under trees.

Here are many species and varieties of Violets, blue, and white and yellow. The Sweet White Violet, *Viola blanda*, whose faintly sweet scented white flowers are veined with lilac, thriving best in a damp location; The Canada Violet, *Viola Canadensis*, whose white flowers are tinged with purple, and which is at home under these trees; the Dog Violet, *Viola canina*, whose blue or lilac-colored flowers, pinkish outside, are carried on leafy stems, and its variety *V. canina alba*, with white flowers; the Heartsease, *Viola tricolor*, to which our beautiful hybrid Pansies belong, which faithfully gives us its little parti-colored flowers in border or rock-garden through a long period; the vigorous tufted plants of the Horned Violet, *Viola cornuta*, whose faintly scented Violet colored flowers, as large as small pansies, are good for cutting, as are also those of its white flowered variety growing beside it, *V. cornuta alba*. Ah! here are yellow Violets, the yellow-horned Violet, *V. cornuta lutea major*, with charming yellow flowers, growing in the half-shade of this border, and near it the Hairy Yellow Violet, *V. pubescens*. Growing in this shady spot in tufts is a very fragrant Violet, *Viola odorata alba*, with pretty white blooms, also the common early blue Violet of the East, *V. palmata* and its variety *cucullata*.

In this rock-garden we see several of the Rock Madworts or Golden Tufts, *Alyssum saxatile*, of spreading habit, with many small golden yellow flowers, and its variety *A. saxatile compactum* of compact form with clusters of fragrant yellow flowers, and silvery foliage; also the Austrian Madwort, *A. gemmonense*, of shrubby growth, and with larger lemon-yellow flowers.

The *Narcissi* of many types are now in bloom, some single, with cup, or trumpet-shaped corollas, others double, some white, some yellow or orange and some bicolor. How pleasing they are to our eyes, and how suave to our nostrils. Flowers of the poets' verses, Spring would indeed not be Spring without them. All flower lovers know them, and as we passed by the Hyacinths and Early Tulips in admiring silence, entranced by their beauty and quieted by their sweet perfume, so we will pass by these charming *Narcissi*.

In the shady location growing in the deep sandy loam are many species of Fritillary; every third or fourth year their bulbs need to be moved. Let us take a little time to note their differences; this Golden Fritillary, *Fritillaria curca* has solitary flowers oddly checkered with brown; the pale flowered Fritillary, *F. pallidiflora* has larger, paler, bell-formed flowers, you see; this shy Fritillary, *F. pudica*, is a graceful plant, with its solitary, drooping bell-shaped unchecked fragrant flowers; its foliage is gray, while that of *F. curca* was deep green and that of *F. pallidiflora* bluish green; next we see the purple Fritillary, *F. atropurpurea*, with several bell-formed deep purple flowers faintly checkered with green, and on leafy stems; this is the two flowered Fritillary, *F. biflora* with its two to ten drooping, bell-shaped, purple-black flowers tinted with green or stems furnished with whorls of foliage; this species, *F. camtschatsensis*, with three bell-shaped, deep purple drooping flowers, and purple leaves as well, is rightly named Black Lily. What a large

number of species there are of this genus *Fritillaria*. This is the Russian Fritillary, *F. ruthenica*, whose flowers of the same form as the others, are a livid purple, near it the Twisted-leaved Fritillary, *F. obliqua*, with grayish leaves and purple and brown checkered flowers; next comes a well-known species, the Guinea Hen Flower, *F. meleagris*, whose large and attractive bell-shaped flowers, checkered with green or white and purple, are excellent for cutting; not far away we see the largest and showiest of all the species, the Crown Imperial, *Fritillaria imperialis*, very effective in these groups among the shrubbery, with its tall stem surmounted with an upright crown of leaves, under which droop red and orange or yellow flowers.

In the full sunlight of this border we find a charming plant with lovely cup shaped, large solitary flowers of brilliant yellow, and nodding buds on leafless stems, the Iceland Poppy, *Papaver nudicaule*; because it is tender, best treated as an annual. If kept cut back, it blooms from Spring till frost—coming almost continuously; near this species is its varieties, *P. nudicaule album*, with white flowers, and *P. nudicaule aurantiacum*, with deep orange-colored flowers. These Poppies are excellent for cutting.

In this half-shaded and sheltered border we see the True Primrose, *Primula acaulis*, with its solitary pale yellow flowers, and the English Cowslip, *P. officinalis*, with one-sided clusters of yellow flowers, both furnished with tufted rosettes of foliage close to the ground; near these the *Auricula*, *Primula auricula*, with clusters of round bright flowers ranging in color from white to purple, surmounting a leafless stem; the *Polyanthus*, *Primula polyantha*, with umbels of red or yellow flowers rising out of the long root leaves.

The little, prim, button-shaped flowers here in the sunlight as an edging to the border, are English Daisies, *Bellis perennis*. How bright they are with their white ray flowers tipped with pink and red.

This is a fine old-fashioned border plant growing in this half-shaded location; we love it much, it is the well-named Bleeding Heart, *Dicentra spectabilis*. Out of its beautiful, deeply cut foliage arise gracefully arching stems of rose-colored heart-shaped flowers.

Forming a carpet in the sunlight of this border, but equally at home in a rock-garden are the several species and varieties of the Moss Pink, *Phlox subulata*. All are evergreen creepers. This one is *P. subulata atropurpurea*, with magenta flowers; this *P. subulata frondosa*, with rose-colored flowers; and this *P. subulata lilacina*, with lilac-colored blooms. Here are other varieties, *P. subulata alba*, and *P. subulata*, The Bride, both with white flowers, but those of the latter with pink centers, and *P. subulata Nelsoni*, also with white flowers.

This is the Trollius-Leaved Larkspur, *Delphinium trollifolium*, with flower stems two feet and more long, surmounted with long, loose racemes of blue and white flowers, which are excellent for cutting; sometimes this blooms twice in the same season.

Here are the Virginian Cowslips, *Mertensia pulmonarioides* or *Virginica*, with a growth of one or two feet, a handsome species. Its blue tubular flowers, which later change to pink, are charming in their pendent clusters.

This is a group of Grape Hyacinths, *Muscari botryoides*, with small globular blue flowers in dense clusters; along with this are other species, *M. commutatum* with darker blue flowers; *M. comosum*, with duller blue blooms; *M. comosum monstrosum*, whose blue flowers have a fluffy, feathery look, and *M. racemosum*, whose pretty, deep sky-blue flowers have a pleasant fragrance.

We never realized before how many flowers are in bloom between mid-March and early May.

GARDEN CLUB OF AMERICA MEDAL

IN the announcement of the New York Spring Flower Show appearing in last month's CHRONICLE, it was reported that the Garden Club of America is offering a prize for the class covering the bird bath with planting arrangements. This was an error. This class is open to member clubs of the Garden Club of America, and the prizes are offered by the Horticultural Society of New York, and the Flower Show management. The Garden Club of America will award a gold medal to be known as the Garden Club of America Medal for the finest exhibit made at the show.

WORK FOR THE MONTH IN THE GARDEN

(Continued from page 500)

ing shrubs generally are those which produce their flowers on the wood made during the previous Summer, and these should be cut back after their blooming period. While those that bloom on wood of the current year may be cut back now. Clear away and burn all rubbish, give a coating of manure, and fork over the ground between the shrubs.

Sprays of *Forsythia* can be cut and brought into bloom in the greenhouse. This makes a most attractive addition to the list of cut flowers during these early months.

Look after hardy climbers and cut back and thin out where it is necessary. Tie and train the growths where they are needed, so as to display their beauty to the best advantage.

Lawns should receive early care, and a dressing of some approved lawn manure should be applied. Bone meal, Scotch soot and wood ashes are excellent and lasting stimulants. Where the grass is poor a mulch of humus generally does much to improve its condition. Rake out moss with an iron rake, and work in some fresh soil and seed next month.

MARCH BIRDS

(Continued from page 503)

the bluebird becomes but a memory. But no such feeble affront can still the merry twitter of the horned lark, nor swerve such hardy northerners as the downy and hairy woodpeckers, chickadee, red-breasted nuthatch, golden-crowned kinglet, pine siskin, brown creeper and Winter wren, from their gradual journeys northward, their nesting grounds in distant lands. The song of the cardinal, the call of the titmouse still carry conviction; and the course of the clamoring wild goose overhead, cleaving high altitudes, unerringly continues its northward flight. The marshes, ponds, rivers and floodplains are filling with wild ducks, mingling in perfect disregard of generic relation, the grebe sounding the dark waters for its agile piscatorial victims. The herring gull on its annual errand, ever searching the inland waters for the spoils of early floods, swiftly pinions its way up the valley. The hawks, red-tailed and red-shouldered, in pairs and trios are winging their way northward. From the marsh land comes the irresistible "kong-quer-ree," the victory song of the red winged blackbird, its dusky relative, the rusty blackbird, feebly chanting a discordant accompaniment. The flats are patrolled by the majestic killdeer and probed deeply by the retiring snipe, and spellbound we turn to the outpouring ecstasy of the song sparrow, vanguards all, to behold again the phoebe, nervously darting from its point of vantage, the true harbinger of Spring.

The Greenhouse, Month to Month

W. R. FOWKES

MARCH and early April are the most exacting months of the year. Seeds must be sown for the flower gardens, and such vegetable plants as egg plants, peppers and tomatoes must be started in the greenhouse. Space is often lacking, and any dry, bulbous plants that have finished their work must be dispensed with.

Chrysanthemums should be potted and from now on must not be checked. Never allow them to become very dry. Keep them cool and airy at all times, and if you must grow other subjects with these Autumn queens, you must make them subservient to the 'mums. Plain soil is best. Loam leaf-soil and a little old mortar rubble is ideal, but remember, the soil now used has to carry on with the plants until their final growth. Good loam, full of fiber, is the proper kind of soil to begin with, and the better the soil, the better the results.

Carnations are now giving their best. Do not forget that the three inches of soil they are growing in is depleted by this time of any real food value. The plants are vigorous, and constant watering is necessary. To keep healthy and of fine quality, they must be fed; a safe and sane manure for them is Totty's Special Carnation Fertilizer. I put two pounds to fifty gallons of water, using the Kinney pump to apply it with. This is more satisfactory for the private place than blood or any other nauseating fertilizer. Use this every ten days.

Bouvardias should be raised for boutonnières, and if you are without these beautiful free-flowering plants, they can be purchased in two and a quarter inch pots from several reliable firms who advertise in the CHRONICLE. They like a cool house.

Caladium corms should be examined and dipped in sulphur, then started in the same manner as gloxinias. Everyone should grow a few of these fancy leaf plants, for they will help to fill a space with beauty, after the palms go to their Summer quarters.

Gardenias should be propagated. They strike readily and will be valuable for late Summer blooming. Keep them in a warm corner, protected from draughts and sun.

Amaryllis are now flowering or preparing to. Keep them plunged in leaves on a bench in a warm, light house. Be careful with water, for they like to be a little on the dry side, and not disturbed at the roots too often. After these fine plants have given their blooms, instead of repotting, feed with soot water, and Clay's fertilizer.

Schizanthus should be sown every three weeks and grown in five-inch pots. They quickly make a fine showing if not pinched. It takes many weeks to grow a fine specimen in a large pot, but this can be left to the large exhibitors, who have ample space for perfecting specimens.

Nectarines, which have set their fruit, should have all dead blooms carefully cleansed off the young fruit, to avoid blemishes later on. Use the hose carefully, and syringe the plants gently, as full force will knock the fruit off. Maintain a proper atmosphere, which should be moist, and watch the temperature. Avoid draughts when ventilating, as the young leaves and fruit will become blistered. This is an anxious period for these plants, especially for the busy gardener, for they must be attentively looked after.

Gloxinias that have filled their first pots with roots should be given their final potting. Let the compost be half leaf soil, the coarse, flaky kind, and as they are not deep-rooting plants, place plenty of crocks for drainage. Fibrous loam, dried cow manure, and a little bone meal and sand will grow them very well but do not use bone too heavily. They like a moist, genial atmosphere until the flower buds show color, and then they enjoy a more airy and somewhat lower atmosphere. The best gloxinias I have seen have been grown in old-fashioned, heavily rafted houses. They do not like the piercing atmosphere of the modern house, with steel roofs and dry cement floors. It is a good thing to place a few tobacco stems around to drive thrips away.

Buddleia asiatica should be propagated, one large plant will give a good number of cuttings. If you do not already grow it, begin now, for you can purchase young plants cheaply. About one dozen well grown plants are as many as the average place can take care of.

The lovely *Achimenes* is an excellent plant and another inexpensive one. The hanging baskets that the oxalis have just finished their blooming in, will suit them nicely, and the same treatment. Just line a basket with moss and light soil, and place two or three bulbs in a six-inch basket. They will be charming in a few weeks. These plants thrive in full sunlight and with ordinary care, but demand plenty of water.

Our most admired friends of all, the orchids, require much attention now. Brighter days call for more air, a moist atmosphere and more mist-like spraying on the foliage, but on no account should the compost become wet. Orchids succeed best on the dry side, but this does not mean the European rest. There are a number of varieties that have finished their blooming, and if they need repotting, do it now. *Laelia anceps*, *Cattleya Triana* and *Percivaliana* come under this category. Do not repot an orchid unless necessary, but if the roots are hanging over the pots and the plants are loose and straggly, then repot.

Mix a compost of one-third moss, two-thirds peat, and a few crocks. Use clean pots and half fill the pot with crocks, and place a little of the compost in it and set your plant in carefully. Press the peat very firmly, leaving the finished off plant a little higher than the pot, so that water will not lodge in the young growths too long. An orchid loosely potted will not thrive.

After repotting, the orchids need classifying, and the newly potted ones should be placed together. Do not make the mistake of soaking these plants. The new compost will absorb a lot of water and call for more, but we must remember, as we have disturbed a plant and its roots are torn, it does not need excessive moisture. Unless you are an expert, let the hose alone; use the fine syringe several times a day, and shade. New roots will soon ramble through and the plant take on a better appearance.

Cattleya Mossia, the oldest of the family, is now sending up its lovely fleshy blooms, and this calls for more water as the buds emerge through the sheath.

Cattleya Schraderea will take, and seem to enjoy, a higher temperature than the others. Its odor is delightful,

but do not allow one spot of water on the blooms or they will be spoiled.

Oncidiiums as a class do not like too much water on their foliage, and the better plan is to dip the pot in a pail of water. I think the cause of deterioration of so many of this beautiful family is due to a too free use of the hose in general collections, and serious damage is done before being noticed.

Calanthe Veitchii, that has been at rest in a flat of peat dust has now started to grow, and should be potted. The compost is slightly different. A little cow manure and fibrous loam should be added to the moss and peat, unless your bulbs are large. I should use three-inch pots to commence with, and no crocks. However, I should use

crocks in the final pots, which are of the six inch size for one bulb. This plant likes heat, and as it makes all its growth in Summer, it is no expense to any one growing it.

The mealy bug and spider usually assail the plants. They should be carefully syringed two or three times a day. All orchids should stand on a stage, or on inverted flower pots; they will not shrivel in ash soil or in a hard bed.

Cymbidiiums are noble plants, *Lowianum* and *cburneum* are by far the most popular varieties grown. They like an intermediate house to live in, and a little loam in the compost. Their vigorous spikes often attain a length of twelve feet.

On the Gardeners' Side of the Fence

KATHERINE FELLOWS

AFTER the disturbances and distress of the past ten years, the country is taking up the task of reorganization. Many things that lay dormant during the war are reviving, and among these is horticulture. We are going to garden again—not alone for good, but for pleasure—and if not this year, sometime in the near future. Many of us will dig in our own backyards, but for others it will be possible only by hiring good workmen.

This gardener of the future, who will he be, and in what garden is he to grow?

Recently this question has been much discussed. Some say the luxurious and showy places with their burden of overhead expense, are soon to become rare. The future gardens are to be more modest, smaller, less pretentious, but in many of them, whatever the scale, there will be a demand for trained workmen. What of the supply?

Many articles upon this subject seem to be echoes of the employers' or landowners' views, with special reference to the gardener as a class. It seems curious that other phases of the situation seem to have passed unnoticed.

Gardening is an art, but it is also a profession. To be a success in any art, one must have a certain *aptitude* for it. Then it must not be distasteful. In fact, one might say that it is rather essential to find it enjoyable. On the other hand, it is a profession requiring long apprenticeship, hard work and illimitable patience.

Whichever way gardening is categorized, it is usually followed by people who have an inherent love of soil. As an art it pays more than generous dividends. The satisfaction experienced in the work for its own sake is none the less real, although it cannot be felt vicariously. For the most part, this side of the case takes care of itself. The sad fact of the matter is that we face a lack of gardeners, because we have allowed gardening to be so largely its own reward. Blue ribbons and medals, however delightful to possess, will not replace necessities.

The fact is now well known that not only have we lost our present supply of young gardeners from across the sea, but that the sources from which they came in the past, have ceased to exist. The young British apprentice, who laid down his potting tools for "gat" and bayonet, fought shoulder to shoulder with mechanics of one sort or another. He learned much about hours of work and still more about wages. Very well, we say, create an interest and develop our own source, and from this will come the gardeners of to-morrow.

To this end suggestions have been made that we stimulate interest in children by Nature study, school gardens, letting the minds of the boys and girls "expand to the

joys of self-expression of outdoor life," whatever that may mean. These things are admirable in their place, but here they serve only to obscure the issue. You will never fill depleted ranks of trained gardeners from any source until you offer adequate payment for work done.

You may look to the institutions that supposedly foster this and allied subjects to bridge the gap. Your opinion as to the desirability of theoretical training is good, but the fact remains that the men graduates show no hurry to follow the practical side of the gardening. Those who turn to it are usually the less capable ones, for the clever or talented man has found innumerable opportunities with more than adequate compensation. "Young America" will never follow a craft, however much it may be its own reward, unless he receives payment proportionately.

There is another element involved in this lack of apprentices in the gardening profession. Most superintendents and gardeners practically sell their souls to their employers. They must be eternally at the beck and call of whims and fancies. In some cases they are even expected to help beat rugs, hang pictures or move furniture. Often they accept their fate with a curious pride in wishing to class themselves as servants rather than be open to the insult of being "shown their place."

A gardener may have peculiar likes and dislikes, but what of his employer? Are there not blue gardens, white gardens and pink gardens? And on many estates, it is as much as the gardener's life is worth to be caught with a red flower in his white garden. He must rise early and pull them out, lest milady discovers them when she comes into the garden to enjoy the air.

Table decorations that fail to please, house plants that leak on polished tables, conservatories that need constant replenishing, become veritable delusions and snares.

"Vegetables may be raised in excess" to feed some "overfed employers," but it is notorious on almost every estate, the servants are poorly fed as to quality, and sadly underfed as to quantity. The mistress of the house knows that the kitchen exists only from her own table and the accounts rendered. She knows less than nothing of the actual food requirements of a hard working class.

Again the gardener is blamed because the vegetables sent in daily lie a week in the pantry, and it would never do to doubt the cook!

Undoubtedly the incompetent, self-seeking, dishonest gardener exists. His prototype is everywhere. On the other hand, the men who are following this profession today are for the most part worthy of profound respect.

A Lesson on Plant Physiology and the Plant in Relation to Its Environment

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

ALMOST immediately after the plantlet emerges from the soil into the light it assumes a green color. This is due to the formation of chlorophyll, which is the name given to the green coloring matter of plants and it can only be formed in light. If we prevent the access of light to a green plant, or to part of it, as in the earthing-up of celery, the green color disappears. Without this chlorophyll no formation of food can take place, and the first step in food formation is the absorption of energy from light by the chlorophyll; as a matter of fact this energy comes from the sun and is used by the chlorophyll to break up or take to pieces, the carbon dioxide absorbed from the air and water with matter in solution, absorbed from the soil by the roots; these are all recombined into foods for the use of the cell protoplasm in making new parts and repairing waste; the formation process being known as *photosynthesis*, literally, "putting together by light."

Not until this food manufacture commences, and the assimilation of it carried on, can new plant substance be formed. During germination, new cells containing new protoplasm, are formed in the plantlet from the food supply of the seed, but until chlorophyll appears and photosynthesis begins, the entire plantlet, with whatever may remain of the seed, weighs no more when dried than the seed weighed previously to being sown.

The above work is carried on by the leaves, and the main function of these may be said to be that of food preparation.

If we examine an ordinary leaf, it is seen to consist of a green substance through which a network of veins is distributed. The larger veins send off smaller veinlets, some of the latter being invisible to the eye. The vein system of leaves, known as venation, is very diverse, but practically every genus, as well as many species, have a more or less fixed system of venation, so much so that in the majority of cases the genus at least a plant belongs to can be ascertained by an examination of its leaf. In some cases a single very prominent vein, known as the midrib, runs through the middle of the blade, from which all the minor veins arise as branches. These veins are part of the conducting system of the plant, although there is no true circulation in plants analogous to the circulation of blood in animals. In addition to acting as conduits for water and sap, the veins act as supports for the leaf tissue.

The upper and under surfaces of the leaf are covered by a delicate and transparent skin (*epidermis*), which itself has no green color. Examined under a powerful microscope this skin is seen to be made up of very small cells. Each cell is bounded by a wall, and in the epidermis they fit closely together and in some cases dovetailing with one another. Minute openings, many times smaller than would be made by the point of the finest sewing needle, will be discovered in very great numbers. These openings are known as *stomata*, and give passageway into the interior of the leaf, putting the internal cells into communication with the air outside and so facilitating the interchange of gases. Plants vary considerably in the number of stomata contained on a square inch of leaf surface, and as a rule there is a much larger number on the under side than upon the upper; in fact some species have no stomata at all on the upper side; but at the same time there are a few having scarcely any openings on the under side, the water lily having none at all. The number of stomata found upon a given area of a given species differs, however, according to the environmental conditions, the quantity varying with the moisture content of the soil and air, light, temperature, etc., and laboratory experiments have shown that a thirty per cent. increase in the continuous moisture content of the soil will produce an increase of fifty-five per cent. in the number of the stomata.

Situated at all the openings of the stomata there exist what are known as guard-cells, by which the stomata are opened and closed according to existing conditions, the principal factors connected with this movement being the humidity of the atmosphere and the amount of moisture the plant is obtaining from the soil. Obviously the closing of the stomata will reduce the amount of water transpired, and this closing will therefore take place when the atmosphere is dry; at the same time, if there is sufficient water available for the plant, the stomata may remain open even when the atmospheric humidity is extremely low.

With a combination of conditions causing the stomata to remain closed for any length of time, harm may result to the plant not only from the deficiency of moisture but because the closing of the stomata will reduce or prevent the activities of the leaf in other directions being carried on. There is no doubt whatever that the activity in all the operations connected with plant life, such as respiration, food manufacture, assimilation and growth can only exist when the stomata are open and the passageway into the interior of the leaf free from obstruction. From this we understand why it is quite exceptional for a plant to remain really healthy for any length of time in a dwelling house. The dry atmosphere of the living room causes the stomata to be always more or less closed; and not only this but the stomata are liable to be continually closed up by dust. Therefore the reasons why the weekly bath for house plants is so beneficial, and for large leaved plants, why frequent cleaning with a moist sponge is so refreshing to them and does so much in the way of keeping them healthy, are apparent.

While the wilting of leaves is brought about by the amount of water transpired by them being greater than that supplied to the plant through the roots, there appears little doubt that the wilting is also a further effort on the part of the plant to reduce transpiration by decreasing the leaf surface directly exposed to the atmosphere. This also explains why leaves of broad-leaved evergreens, Rhododendrons for example, curl or roll up when a period of severe frost as well as of Summer drought prevents moisture being brought up in sufficient quantity to offset the excessive transpiration. The check to root action which is brought about more or less in the operation of transplanting also causes wilting of foliage, and when, owing to faulty methods in carrying out this operation, the work of the leaves is stopped for a prolonged period, death of the plant is almost certain to ensue.

Plants which are commonly capable of maintaining themselves under dry and desert conditions have their leaves and structure modified in a variety of ways to bring them into harmony with such an environment. In such regions each leaf endeavors to expose as small a surface as possible in proportion to substance to the dry air and intense light, for it may be mentioned that the extremely bright light prevailing in some regions would be fatal to many plants even were the moisture conditions favorable. That this reduction in the size of the leaves holds a direct relation to such an environment is evident from the fact that the same species often produces small leaves in a dry region and larger ones in a moist climate. In the case of a group of *Cacti* growing in the desert parts of the Southwest, the leaves have become so much reduced as to be no longer used, and the process of photosynthesis is carried on by the globular, cylindrical or flattened stems. In some species as with the *Yucca*, transpiration is reduced by the stomata being deeply sunk into the epidermis. To the same end we find upon the leaves of many plants a growth of hairs or scales, which may form only a slightly downy covering, or the leaves may be covered by a woolly or felt-like mass, so that the epidermis is entirely concealed.

The skin or epidermis may be regarded as an ever-present check against transpiration, for without it the active cells would soon lose all their water. Some plants have their power of resisting desert conditions increased by what may be regarded as several epidermal layers, and also a layer known as cuticle is formed by the exposed walls of the epidermal cells which, being constantly renewed from beneath, becomes very thick and almost leathery, and this is a constant feature of drought-resisting plants. Also, most plants inhabiting dry regions have facilities for the storage of water, so much so that water may be squeezed out of them in sufficient quantity to relieve thirst. This water is drawn up by the roots which with plants of this character invariably go down very deeply, in the case of the Mesquite for example, the roots have been found forty feet below the surface. The water stored in the leaves is drawn upon by the plant during the daytime when otherwise the roots could not bring it up fast enough for the plant's needs.

Between the two epidermal layers covering the upper and lower portions is a mass of tissue making up the body of the leaf. This

mass comprises cells containing numerous minute green bodies (known as *chloroplasts*) containing chlorophyll which give color to the whole leaf, although under the microscope they are seen to be quite distinct from the cell-protoplasm; but as this distinction is invisible to the unaided eye the green color appears to pervade the entire leaf, more especially as the chloroplasts are arranged along the sides of the cells nearest the outside so that they can get more light.

The cells, of which the leaf tissue is made up, are usually arranged differently in the upper and the lower sides of the leaf. In the upper part the cells just beneath the epidermis are elongated at right angles to the surface of the leaf and stand in close contact, forming what is known as the palisade tissue. In the lower region of the leaf the cells are irregular in form and so loosely arranged as to leave air spaces between the cells, the whole region forming a spongy tissue. The air spaces communicate with one another, thus creating a labyrinthine system of air chambers throughout the spongy tissue. It is into this system of air chambers that the stomata open, and thus what may be called an internal atmosphere is in contact with the working cells containing chlorophyll, and this internal atmosphere is therefore in full communication through the stomata with the outside air.

The white areas of variegated leaves usually contain no chlorophyll, but leaves which are *during growth*, brown, red, or otherwise highly colored contain chloroplasts, the green color in such cases being veiled by the presence of other pigments often present in the cell-sap. The existence of variegated leaves of the white type is an abnormal and not a natural phenomenon; and this feature occupies the same place in the vegetable kingdom as the albino does in the animal; in both cases—all other things being equal—a weakened constitution is brought about, due in the case of a plant, to the fact that a variegated leaf with its fewer chloroplasts has not the same food producing power as a nonvariegated one of the same size with its normal number of chloroplasts.

In general, the function of the leaf as an organ is five-fold: (1) That of carbon dioxide assimilation from the air; (2) that of breaking up this carbon dioxide and the water and its matter in solution sent up by the roots; (3) that of making new substances, or photosynthesis; (4) that of transpiration, and (5) that of respiration; the latter partly includes the first function. The total work of the leaf is intensely complex and wonderfully intricate, but it all goes on in that beautifully, orderly and perfect manner which always characterizes the carrying out of Nature's laws, when the environment is as Nature desires it to be.

Thus the importance of healthy leaves is apparent, but, as before stated, light is necessary for the completion of the manufacturing processes carried on by them, which explains the why of many facts connected with practical plant growing. In green-houses, however correct the conditions of soil, temperature and moisture, growth is considerably less during short days and periods of little sunshine, than it is in long, bright days under the same conditions otherwise. In northern latitudes with a mid-Summer of almost continuous sunshine, a crop of barley, for instance, will be ready for harvest in six weeks after sowing, while the same crop growing several degrees farther south may take four months, and so on.

Both chemical and biological forces appear to be co-operating when the leaf organ carries out its function; and, like every other phase of energy existing upon earth, what may be called the motive power of this functional activity comes from the sun's light and heat, and the energy, light and heat which was absorbed in this way by the leaves of plants growing upon the earth many thousands or millions of years ago we make use of today from their remains in the form of coal.

In the leaf the principal seat of chemical action is in the chlorophyll bodies. Chlorophyll is not a simple substance but is compounded of both organic and mineral matter. Iron, phosphorus and magnesium being the more important mineral elements necessary for its activity. The biological force is active in the protoplasm in which the chlorophyll body is suspended and of which it forms only a small part. Protoplasm is a gelatinous, colorless substance composed chiefly of proteid matter, and in it, that invisible thing known as life exists; in fact protoplasm is the living substance of the plant. No organism, whether plant or animal, can be alive unless its cells contain living protoplasm, and this living protoplasm has come down in an unbroken line from the time ages perhaps ago, when the ancestor of the organism was first created. In other words, protoplasmic life cannot be formed anew, it can only exist today as the result of growth from that which existed in the past.

When the plant cell is first formed the protoplasm contains no chlorophyll bodies or chloroplasts. Small colorless grains first appear, and then the greening of them takes place. The colorless chloroplast may make its appearance in the absence of light,

but the last stage of its development is attained only under the influence of light, and requires a higher temperature than is necessary for the first stage of the process. This explains why, that while in cool, dull weather some growth may take place, vegetation looks yellow because there is not sufficient heat and light to fully complete the second part of chlorophyll development. When plants have a rich, dark, green color, is the time of the largest amount of activity and growth.

Chlorophyll loses its activity and undergoes a decided change as the plant matures, a phase which is seen more especially in connection with annuals and biennials, as well as with those parts of perennial herbs which die down at the end of the season; the same thing happens also when the leaves of deciduous trees and shrubs lose their green color. The organic contents of the chlorophyll bodies and other cell matter is removed from the leaves and dead stalks, and stored up in the seed, fleshy and other roots and underground buds; the matter stored being drawn upon the following year when the seed germinates or the plant starts into new growth. In the case of deciduous plants in which the Summer growth other than the leaves does not die, the matter is stored mainly in the buds, flower or otherwise, which are always formed at the end of each Summer ready for commencing growth in the Spring.

A very important practical matter arises in this connection as regards the permanent well-doing and increase of all hardy plants, especially those of a bulbous, or tuberous rooted character. It must be borne in mind that all healthy, thrifty plants manufacture more food in their cells than they require for their immediate growth. If we remove the green leaves and stems of *narcissi*, lilies, *iris*, peonies and such like plants, immediately or soon after flowering is over, the transference of the matter stored in these parts cannot take place, the result being that the flower-buds for the following year cannot be formed, the plant is weakened and, if the procedure is continued, the plant will die out. As above mentioned much of the reserve material is transferred to the ripened seed, and, as noted in a previous lesson of this series, no act of plant life is a greater drain upon it than the formation of seed. Therefore, if the production of seed is not required and is not the object for which the plant is grown, the production of it in the case of perennials should not be allowed, which can be accomplished by keeping flower-heads cut off immediately the petals drop, a method which also secures to a greater or lesser extent according to species, a more or less continuous production of flowers, when, if seed is allowed to form, only one crop would be produced. Even in the case of those species that never give more than one crop of flowers in a season, by removing the flower-heads, the material which would be transferred to seed will be sent down to the roots and root buds for the next season's use, and by this means they are strengthened.

The chief function of chlorophyll, assisted by the protoplasm, is the formation of starch, from which starch all the matter embraced in the term carbohydrates is derived. If green plants should stop the manufacture of carbohydrates the food supply of the world would soon be exhausted. All other forms of food are in some way derived, partly or entirely, from starch, and there is no way by which this can be produced except through the leaves of plants.

The first function of leaves is the obtaining of carbon, which they do in the form of carbon dioxide, from the air. The importance of this is understood when we realize that about one-half by weight of the dry matter of both vegetable and animal tissue is carbon and the original source of all this carbon is from the air through the leaves of plants. While the amount of carbon dioxide contained in the air seems almost negligible, the quantity being normally not more than three one-hundredths per cent (.03) although this amount may be temporarily greater in manufacturing districts and in the neighborhood of large cities, still the quantity in the present atmosphere is sufficient for all the needs of plants throughout imaginable time. Further, while vegetation is continually drawing carbon dioxide out of the air, there is practically an equal amount being returned to it from animal respiration—the quantity estimated for mankind alone is not less than fifty million tons per day—and the consumption of fuel. While the percentage amount in the atmosphere is small the total quantity is quite large, as over each acre of the earth's surface there are about thirty tons of carbon dioxide always at the disposal of plants.

As above mentioned, one important operation taking place in the leaf is the manufacture of carbohydrates, of which the practical starting point is starch, and from the latter all the other carbohydrates, such as fat, sugar and cellulose are derived. The raw materials used by the leaf in the manufacturing process are water which is obtained from the soil by the roots, and the carbon dioxide which enters the leaf through the stomata. Water is

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Departments of Foreign Exchange and Book Reviews

FORMAL ASPECTS

The treatment of comparatively small spaces enclosed in geometrical lines requires care. In such cases, bold, simple combinations are preferable to a collection of many plant species, and one genus, for instance, the *Iris*, may be planted in formal places without forming beds of precise design. The latter remark applies equally to herbaceous Pæonies. A simple drift of mauve *Iris*—of the *pallida* section—and a breadth of pink Pæonies, planted in adjacent beds, make a pleasing combination when in flower, and later in the season, the *Iris* leaves accentuate the beautiful coloring of the Pæony foliage. If prominence is given to a central position the universal sundial might give place to an effective bed of *Dianthus*; a variety of *D. Allwoodii* would be eminently suitable. Generally speaking a central grass plot is preferable to structural ornamentation.—*The Gardeners' Chronicle* (British).

A NEW STRAIN OF EARLY TULIP

At the meeting of the Tulip Committee of the Haarlem Bulb Growers' Society, held on January 10, Messrs. E. H. Krelage and Son showed five varieties of forced Tulips in pots. These Tulips are crosses between Duc van Thol and Darwin varieties and combine the earliness of the former with the colors and the longer stems of the latter. The flowering period out-of-doors is the same as that of the early single Tulips. These varieties may be forced easily to bloom the first week of January, and some varieties have been already flowered in perfect condition, but with shorter stems, on December 20. The colors of the varieties shown were bright pink, salmon, orange, maroon, cerise and brown with sulphur edge, but we understand that Messrs. Krelage already possess a great many varieties in other shades. The first crosses were made in 1909, and have since been continued yearly. These newcomers which, compared with the existing varieties for early forcing, and repeatedly tried, prove to be superior, will doubtless have a splendid future, for a combination of early forcing qualities, new colors and good stems would mean a decided advance on all early forcing Tulips.—*The Gardeners' Chronicle* (British).

THE DOUBLE WHITE GYPSOPHILA

Opinions may differ as to whether the single or double form of *Gypsophila paniculata* is the more beautiful, but, growing both, I give my verdict in favor of the double, with its numerous pure white, rosette-like blossoms, borne on spreading panicles. Whether the sprays are required for cutting and mixing with other flowers in Summer and early Autumn, or for using for Winter arrangements of "everlasting" flowers, it will be found that the double *Gypsophila* will last considerably longer. Anyone contemplating additions to his borders of hardy plants should find room for one or two specimens. In planting it is important to remember that *Gypsophilas* like a rich and deep soil, as their roots penetrate a long way, that a sunny position is essential, and, equally important, they should be given plenty of room.—*Gardening Illustrated*.

ANTIRRHINUMS A SECOND SEASON

It always seems a pity to treat Antirrhinums as annuals, as one does not thus get the full benefit of blossoms from them. An instance has come under my notice where, almost up to the end of October, a number of plants bloomed exceedingly well. Trouble had been taken, when they were put out in May, to group them in colors, and the result was very charming, and called forth not a little praise from people who passed the garden daily. They were very stocky plants, and gave evidence of being a useful lot another year; but a jobbing gardener received instructions to "put something else in," and so in November they were uprooted in favor of Wallflowers. I have no fault to find with the beauty and fragrance of such delightful Spring flowers, but it seems to me that many who grow Antirrhinums overlook the fact that "old plants are the first to flower," and on this account are worth keeping. More than this, if old plants are trimmed of dead wood in Spring and reinvigorated by forking in some manure round the roots, it is surprising how great is the output of bloom. The raising from seed in Spring, pricking off, and planting out afterwards for blooming in Summer are the recognized *modus operandi* with a good number of plants which grace the garden; but surely it is well to make an exception of a subject like the *Antirrhinum*, particularly so when a good strain has been secured, and one knows if the plants are encouraged that they will flower well again the following Summer, often longer, indeed, than Spring-raised plants.—*Gardening Illustrated*.

STARTING TUBEROUS BEGONIAS

One of the best growers of Tuberous Begonias I ever knew made a practice of starting the tubers before potting them. He treated them much in the way that seed Potatoes are treated, the difference being that the Begonias were laid on damp material in a temperature of about 56 degrees. *Begonia* growers are well acquainted with the fact that sometimes a percentage of the tubers either fails to start, or does not go away, freely, but this man said that by his treatment not more than 1 per cent. failed. The appearance of his tubers certainly justified this statement, for the eyes were plump and were pushing out strongly. It is, of course, easy to examine them when treated in this way, a great advantage especially in the case of choice varieties. Should there be any signs of rot it can be promptly dealt with. When fairly started the bulbs can be at once put into the blooming pots, which economizes later, whereas where there is no sign of life it is by no means safe to do so. They must in such case be put into quite small pots and shifted later on.—*Gardening Illustrated*.

BUDDLEIA AURICULATA

This is a deliciously fragrant shrub. It is evidently much hardier than is usually imagined, since on the coast of the Bristol Channel, it forms huge bushes 15 feet to 20 feet high, bearing in abundance the creamy white flowers which scent the air for some distance. In exceptionally severe Winters it is liable to be cut back by frost, but in Spring it breaks vigorously and soon sends out strong branches which flower in the following Autumn. Like most *Buddleias*, it bears pruning well, and the cut branches are charming for house decoration. There seems to be considerable confusion between *B. auriculata* and *B. asiatica*, and it was only by submitting specimens of our plants to Kew that we learned the true name. In the catalog of plants grown at La Mortola, the native country of *B. auriculata* is given as South Africa. Is this correct? I have never seen true *B. asiatica* and should like to know in what way it differs from *B. auriculata*. The latter is readily propagated by cuttings, inserted either in a cold frame or in the open border, which form nice young plants in a couple of years.

Buddleia auriculata is a native of South Africa and *B. asiatica* widely distributed in Eastern Asia and Java. *B. auriculata* has broadly lanceolate leaves, those of *B. asiatica* are much longer and narrower. The blossoms of *B. auriculata* are cream or primrose, produced in Autumn in many flowered cymes, those of *B. asiatica* are pure white, produced in Winter and Spring in slender racemes, clustered into tail-like panicles at the ends of the branches. Both are delicately fragrant.

BUDDLEIA FORRESTII

Seeds of this handsome shrub were sent by Mr. Forrest from Western China in 1918. It is a vigorous species belonging to the *variabilis* group and evidently appreciates rich soil and plenty of space for full development. It forms a fine bushy plant of over five feet in height. Its chief feature is the dense white tomentum on the square stem and on the underside of the leaves. The racemes of flowers are similar to those of the well known *B. variabilis*, but are shorter—at any rate in young plants. The flowers are a light mauve in color and are not so attractive as in the best forms of *variabilis*; their strong honey-like scent is delicious, and appeals to the Red Admirals and the Peacock butterflies as much as it does to the gardener. It should prove a valuable shrub for grouping on lawns against a background of dark foliage to show up the beautiful white underside of the leaves. It is quite distinct from *Buddleia nivea* in the shape of the raceme and much paler flowers, and is a finer shrub altogether. Hard pruning in Spring will probably suit *B. forrestii* as well as it does *B. variabilis* varieties.—*The Garden*.

[Most readers to whom the GARDENERS' CHRONICLE comes would of course have to grow these *Buddleias* in pots to be taken in for Winter protection or would have to safeguard them very carefully if they were left out in the garden—Ed.]

HARDY WINTER-FLOWERING PLANTS

In most gardens there is a lack of Winter-flowering plants, those grown being limited, as a rule, to Christmas Roses, *Helleborus niger* and its varieties, followed by the less well known Lenten Hellebore, *H. orientalis*, of which there are many named varieties, in varied and quaint colorings. The Winter Jasmine,

Jasminum nudiflorum, is also common in gardens. The Witch Hazels are, however, not so well known, but are so charming that they should be represented in every garden. They include *Hamamelis virginica*, which is commonly used as a stock for the other species; *H. arborea*, *H. japonica*, and its lemon-yellow variety, *Zuccariniana*. Beautiful as these are, they are surpassed by *H. mollis*. The flowers, which resemble twisted gold wire, are produced in wonderful profusion and seem unaffected by severe weather; not their least charm is the delicious fragrance, a single bush scenting the atmosphere for yards around. Cut sprays of this *Hamamelis* are charming for room decoration, as also is the better-known Winter Sweet, *Chimonanthus fragrans*.

Of the Heaths *Erica carnea* and its varieties flower all through the Winter, and it is surprising these plants are not more generally planted. The merits of the Winter-flowering Honeysuckles, *Lonicera fragrantissima* and *L. Standishii* must not be overlooked.

Garrya elliptica is a beautiful Winter-flowering shrub that is far from being plentiful in gardens; the maple plant, which is most common, produces its long, gray-green catkins in great profusion. The plant is hardy in the south in the open; in the north it makes a beautiful wall shrub. The Glastonbury Thorn flowers off and on according to the weather, throughout the Autumn and Winter.

The Winter Heliotrope, *Petasites (Tussilago) fragrans*, is worth planting in rough corners. The deliciously fragrant *Iris stylosa* and its varieties should be included in every garden in the Southern counties as they flower throughout the Winter and Spring, according to weather conditions.

In gardens in the South and West at least *Fiburnum tinus (Laurustinus)* flowers more or less all through the Winter and Spring.—*The Gardeners' Chronicle* (British).

THE CHINESE WITCH HAZEL (HAMAMELIS MOLLIS)

The several Witch Hazels are all popular and interesting by reason of their flowering when few other hardy plants are in blossom, and on account of their weird, spidery-looking flowers, but for general effect there is nothing to surpass the subject of this note. It blooms in advance of the Japanese *H. japonica* and its varieties, and is usually at its best in the South of England from Christmas onwards for about three weeks. In China it is said to grow into a small tree 30 feet high. Here it forms a spreading bush with more or less erect branches clothed with large, roundish or broadly-oval leaves, which, together with the young wood, are covered with down. The flowers are borne in small clusters from the previous Summer's growth, each flower being over an inch across, with five narrow golden petals, which, instead of being twisted or crimped, as in *H. japonica*, are flat, with incurved points. The calyx offers a contrast by being reddish in color. Not the least noticeable of the plant's many virtues is the pleasant, Primrose-like fragrance which accompanies the expansion of the blossoms, a fragrance that is noticeable several yards away. On a sunny day a well flowered plant is a lovely object, while even during less favorable weather conditions it commands attention. Fortunately, it is an easily-grown shrub, succeeding best in light, loamy soil to which a little peat has been added, although the latter is not essential to success. It can be propagated from seeds, which are borne freely, and also by layers, or by grafting upon *H. virginiana*, the American Witch Hazel. A few shoots taken into the dwelling room and arranged with the foliage of *Berberis aquifolium* are very effective.—*Gardening Illustrated*.

CHRISTMAS ROSE (HELLEBORUS NIGER)

A more useful group of hardy plants than the Christmas Rose can scarcely be imagined. It is a family of plants that has been greatly improved and added to during the past twenty years. *Helleborus niger* is so called because it blooms at Christmas and its flowers open like a rose; it is called the Black Hellebore also because of the color of its leaves and its fondness for growing in dark and lonely places. Its blossoms are particularly bright, cheerful and very acceptable at the dead season of the year, where their value for decorative purposes or for cutting can not be overestimated. They are thoroughly hardy and very easily grown; they can not be too highly recommended.

Some amateurs find difficulty in cultivating Christmas Roses. They need a generous soil, fairly heavy and retentive, in which they can root freely and deeply, and frequent mulches with manure; at any rate, one good one immediately after the flowering season, when the plants are somewhat exhausted. It is a good plan to plant a bed with them, or a border facing north-east or north, sheltered from the direct rays of the sun, suits them well. Place over them a frame in November or December, or as soon as the flowers begin to open. This tends to keep the flowers clean and to improve their quality.—*The Garden*.

UNDERGROWTH FOR A BEECH TREE

It is very difficult to get shrubs to grow under a Beech tree, especially if it is an old-established specimen, because, in addition

to the dense shade, the Beech has such an enormous system of fibrous roots near the surface. If your tree is a specimen on a lawn, with the branches well clear of the ground, grass will grow up to the trunk, and, on the whole, it is the most pleasing carpet. If the ground is broken up in certain places and fresh soil added, Crocuses and *Narcissi* might be planted and would succeed for a time. If the ground is grubbed over and fresh soil added, Ivy, *Hypericum calycinum*, *Berberis aquifolium*, and *Ruscus aculeatus* (Butcher's Broom) would grow for a time, but would be starved out in a few years. In high, open Beech woods, Bluebells grow freely, as well as Brambles and other undergrowth where there is sufficient light.—*The Gardeners' Chronicle* (British).

DEPARTMENT OF BOOK REVIEWS

FERTILIZERS AND MANURES, by Sir A. D. Hall, M. A., F. R. S.; E. P. Dutton and Company, New York.

Without this volume it would scarcely be credible that so interesting reading could be made of the subject of fertilizers. Literary skill of the highest order has been devoted to making two chapters in particular, the introductory, which narrates the History of Manures, and the tenth, which sets forth the Theories of Fertilizer Action, of world-wide importance. But not only do these two chapters deserve attention nor is attention well bestowed upon them for the interest of the narrative alone. They, and all the rest of the book, are in subject matter also what might be expected to emanate from the specialized studies of a man long the director of the Rothamstead Experimental Station, the oldest institution of its kind in the world, a man who writes with full understanding of how it came about that "the discovery and introduction of artificial fertilizers and feeding stuffs . . . enabled the British farmer to raise his output per acre by at least 50 per cent during the reign of the late Queen (Victoria)." He attains very gratifyingly his object of making the reader understand the fertilizers' mode of action and their relation to particular crops and soils while recognizing the fact that because of variations of climate, as well as of soils, it is impossible to specify the absolutely right course either in cultivation or in manuring. Consequently, the scholarly theories of Chapter X he ably defends by showing that "it is only by thinking about the rationale of manuring we can arrive at the right practice."

Clarity of thinking pervades. Following the argument one finds it not difficult to conclude with the author that "the picture of the farmer carrying the manure for a field in his waistcoat pocket and applying it with a hypodermic syringe is still a vision of the future." The farmer is shown to be justified in his prejudice in favor of an organic source of nitrogen and due importance is assigned to improving the tilth of the soil along with all possible use of the more conveniently handled and more economical sources of plant food.

Sir Hall's treatment of the subject, though written for Englishmen, obviously deserves a place in this country alongside of the supremely valuable products that have resulted from American thought and experimentation.

THE VEGETABLE GARDEN, by M. M. Vilmorin-Andrieux; E. P. Dutton and Company, New York.

This must certainly be the premier book of its class and the publishers are evidently justified in claiming that it "is generally recognized as being the most complete and authoritative of its kind." This, the third and English edition, published under the direction of the celebrated William Robinson, has been brought up to date by the inclusion of an addendum by W. P. Thomson, in keeping with the decided stimulus given to vegetable growing by the war. Newer varieties of well known vegetables have been given recognition and some really distinct new vegetables, like the White Sunroot and Daw's Champion Rhubarb, have been added. Out of the chaotic state, resulting from the liberty taken by seedsmen in naming varieties for their own advantage, considerable order has been brought by identifying each species and variety through the painstaking study of all data in any way ascertainable and by comparative cultivation. After the botanical, and the various common names in different languages, is mentioned the native country; then follow a brief history of the plant, a description of its mode of growth and a great deal of attention to the seed. The descriptions are supplemented by very many wood-cuts, all unusually clear and illustrative. The use of the plant and the methods of preparing it for the table, as might be supposed in a work originating in France, are topics that are handled deftly indeed. Methods of cultivation are, appropriately for a work intended to be cosmopolitan, not stressed. The notes of this character in the English additions, under the various headings, are, however, quite elaborate and reveal intensity of

cultivation that to American gardeners seems fastidious and finical, if not ludicrous, because of its refinement and expense.

Our gardeners can not, of course, rely upon the dates and various other matters which are governed by differences of climatic conditions. But, besides finding such interesting reading concerning the history of the various vegetables, they would be encouraged to make experiments with many excellent edibles as yet unknown to them and some of which might find a permanent place among garden delicacies in certain localities. This would help the nation greatly toward winning its "way back to a simpler, healthier food."

THE ROMANCE OF OUR TREES, by Ernest H. Wilson; Doubleday, Page and Company, Garden City, N. Y.

It is opportune that this elegant work appears at a time when trees have begun to be appreciated as in no other period. Even before the Great War caused the sacrifice of much fine timber and the mutilation, if not the destruction, of thousands of fruit trees had forestry been receiving increasing attention in every civilized land. Now the magazines and even the daily press, in this country and practically all over Europe, are awake and are rousing people to the desirability and the need of planting new trees and of protecting the old. "A nation's finest trees should rightly be counted among its most prized national treasures; but of the countries of the world today Japan alone regards ancient trees as a national treasure asset! Such they truly are, and there is no escape from the punishment Nature metes out to lands whose forest growth is destroyed. In this country the price is being exacted, and in countries like China and Korea the multiple interest is so great that the lands groan beneath the burden. With no trees to hold the soil on steep slopes when heavy rains fall, rivers become charged with silt, break their bounds, destroy everything within their reach—crops, villages and inhabitants."

For writing the Romance of Our Trees there could be no better equipment than that of Mr. Wilson, who has now often successfully explored those portions of the old world that are richest in plants adapted to the conditions obtaining in the northern tier of the American states, and who, through connection with the Arnold Arboretum, has been able there to study their adaptation best.

The chapter Our Nut Trees displays scholarly insight and grasp of conditions combined to make good sense in treating of a field in which vagaries are often disastrous. The chapter given to the magnolias makes the reader wish, even if he had never thought of it before, that he might have an arboretum of his own in which to enjoy them to the full. The eulogy of the horse-chestnuts is poetry fine enough to please the most fastidious, who might complain only that the red-flowering receive too little praise. It might be complained also that the small flowering trees, the cherries, the wild crabs, the plums and the peaches, and the others so appropriate for the shrubbery and the woods borders, do not have bestowed upon them the honor vouchsafed to those already named and to the Ginkgo, the Cedars, the Yews, the Beeches, the Common Fruit Trees, the Poplars, the Willows, the Trees of Upright Habit and the Pygmies. But of these the Cherries have before been honored with a book all to themselves and if Mr. Wilson were to write about the others, as it is to be hoped he may soon do, they would need an additional volume.

Most of the chapters have appeared in the *Garden Magazine*. But the new prefatory chapters alone make the book well worth while. Nowhere else could one be so impressed by the Ancient Lineage of trees; nowhere else could one find so clearly set forth the present-day distribution of trees; nowhere else could one learn so to marvel at the wonderful individuality of their rugged trunks; nowhere else could one prepare better to comprehend their Autumn glory.

PRODUCTIVE SOILS, by Wilbert Walter Weir, J. B. Lippincott Company, Philadelphia.

Designed originally for farmers the work, in its abridged edition as a volume in the valuable Farm Life Text Series, is intended to serve not only as "a farmers' ready reference or practical guide in successful soil management," but also "for vocational and other high school instruction" and "in secondary agricultural schools and vocational schools." With this last end in view there are offered, at the end of each chapter, suggestions for demonstrations and for laboratory exercises and home experiments and projects. But it is a book that throughout is full of instruction, clear, definite, accurate and impressive, for all who may be concerned in any way with the source, direct and indirect, of the supply of nearly everything that meets man's physical needs. The kitchen-gardener, the floriculturalist, the horticulturalist, the nurseryman, the park superintendent and the landscape gardener can find much help, very much help, particularly in the part bearing the title Factors Determining Soil Fertility. Under this head are ranged chapters given to Soil

Water and its Relation to Soil Fertility, Land Drainage and Irrigation, Tith and Tillage, Soil Organisms in Relation to Soil Fertility, Nitrogen, Phosphorus and Potassium in Relation to Soil Fertility, Soil Acidity and Liming in Relation to Soil Fertility and Harmful Agents in Soils Affecting Fertility. All of these subjects are handled with a completely satisfactory degree of thoroughness and exhaustiveness that in every paragraph and in every sentence reveal nice discrimination. Of these chapters the one on drainage and irrigation is of especially general value, and, to only a slightly less degree, the one on harmful agents affecting fertility. The one named here last is perhaps the only one in the entire book which might have been advisedly expanded a little more. But it is a work devoted primarily to a study of soils, a subject that though obviously so fundamental to success in making plants grow well is too much overlooked, commonly, because of easy faith in fertilizers and superiority of seeds or in the excellent condition, it may be, of the plant that is set into the soil.

As a volume of ready reference it is most laudable for the evident perfection, as working instruments, of the Table of Contents and of the Index. The general arrangement and the typing correspond with the author's firm grasp and general mastery of the subject matter.

A LESSON ON PLANT PHYSIOLOGY

(Continued from page 516)

made up of one part of oxygen and two parts of hydrogen; while carbon dioxide consists of two parts oxygen and one part carbon, and all these elements enter into the structure of a carbohydrate. The elements of water and carbon dioxide are separated in the leaf and recombined to form a carbohydrate, in which process oxygen is a waste product and is given off by the working cells, some of it being respired through the stomata and the remainder used in other processes taking place in the plant cells. The process is made more clear by a consideration of the chemical formulae involved. Carbon dioxide is composed of one part carbon and two parts oxygen, the chemical formula of which is CO_2 ; while the formula for water is H_2O . If we combine these together we get H_2CO_3 , or two parts hydrogen, one of carbon, and three of oxygen. The composition of a carbohydrate is practically two parts hydrogen and one each of carbon and oxygen (strictly speaking its formula is $\text{C}_6\text{H}_{10}\text{O}_5$); therefore the combination of carbon dioxide and water contains two parts more oxygen than is required for starch manufacture and is therefore unused by the chlorophyll bodies, and is eliminated. It is this fact which causes the respiration of plants in the sunlight to be practically the inhaling of carbon dioxide and the exhaling of oxygen, although only a part of this oxygen passes out through the stomata into the air as some of it is diffused through the plant for the use of the protoplasm. This manufacture of starch ceases in the dark, so that after sunset the interchange of gases in the leaf, or respiration, no longer takes place—or at least only to a very small extent—and oxygen is not, therefore, exhaled by plants during the night.

This brief sketch of the work carried on by leaves shows the importance of giving each plant sufficient room for it to attain its maximum leaf-development. Plants allowed to remain for any length of time in an over-crowded state not only produce weak foliage but the leaves are deprived by each other of light and air. Thinning out when necessary should always be started at the earliest possible moment, as the longer the period during which plants are crowded together, the greater will be the harm done to them, and the more difficult will be their recovery—if such recovery ever takes place—to a condition of a healthy, luxuriant growth after they have had more room given them. Not only must plants have space for proper development but those in greenhouses, living rooms, etc., must be given the best possible atmosphere environment. The fact that this environment in its fullest sense is practically impossible of attainment in a dwelling house is the main reason why so few plants do well there for any length of time. In this connection, however, much may be done to keep plants healthy by maintaining clean foliage and by not allowing the stomata to become choked with dust. Cleanliness of foliage is under all conditions one of the first principles in successful plant culture. To this end attacks of fungi and insects should be prevented, or at least never allowed to make any material headway.

Boston Spring Flower Show
Horticultural Hall
Boston, April 6-10

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

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AT THE NEW YORK SPRING FLOWER SHOW

As announced in these columns last month, the association will have headquarters at the New York Spring Flower Show, Grand Central Palace, March 14 to 20. The Secretary expects to be in attendance throughout the show to confer with country estate owners regarding gardeners' services, and also to meet the out it will no doubt draw many gardeners to the show at Boston.

THE BOSTON CONFERENCE OF GARDENERS

The gardeners' conference to be held under the auspices of the New England gardeners will take place on Friday afternoon, April 8, instead of April 7 as previously reported. This is the day that the American Rose Society will make its exhibit, and it will no doubt draw many gardeners to the show at Boston.

An executive meeting of the Board of Trustees and Directors will be held on the same day.

THE LOCAL BRANCH FOR NASSAU COUNTY, N. Y.

The members who have started the movement for a local branch of the National Association of Gardeners in Nassau County, N. Y., have decided to call a meeting of the members of that county and vicinity during the latter part of April to organize and to discuss plans of activities that the local branch will engage in. It is expected that the first meeting will be held at Glen Cove. Notice of date and meeting place will be published in the April number of the CHRONICLE.

NEWPORT BRANCH OF THE NATIONAL ASSOCIATION OF GARDENERS

Andrew L. Dorward presided. William Gray, director of the national association for Rhode Island read a very interesting letter from Secretary Ebel on the work the association is at present actively engaged in.

The report of the national convention held in St. Louis, was

discussed, especially the discussion on "Examination for and Classification of Gardeners." Mr. Pring's remarks that the fundamental facts in gardening were local conditions were unanimously taken exception to, the consensus of opinion being that a good gardener in the East would also be a good gardener in the West, or any other place where he is located, the only difference being his method of procedure to suit his environment, the use of common sense and good judgment.

P. W. Popp of New York, who was present at the convention, gave a good talk and enlightened us on some matters of the association not quite clear. FREDERICK CARTER, Secretary.

READJUSTMENT PERIOD ON COUNTRY ESTATES

The Secretary has lately had several visits at the office from owners of country estates to discuss salary readjustment, the prevalent idea seeming to be that as readjustments are quite general, they should also affect the gardener. The secretary expressed a contrary view to his callers, for while it is true that ordinary labor did advance from two and a half and three dollars to five dollars, and in some instances to six and seven dollars a day, the skilled gardener's salary, where it was advanced, has not averaged a dollar a day, and such advance has only brought the salary of the gardener and his assistants to the normal standard where it should be. So far as the ordinary garden laborer is concerned, the readjustment in his wages is quite in order, in fact, it has already occurred in most localities, where the laborer's wage is now from three to four dollars a day. We are glad to report that in nearly every instance the estate owners who consulted with us accepted our view.

NEW MEMBERS

The following new members have been recently added to our membership list: Arthur Chilman, Bar Harbor, Me.; Richard Murley, Cleveland Heights, Ohio; Herbert Collins, Manhasset, L. I.; Joseph Holmes, Port Chester, N. Y.; Seymour S. Hicks, Mill Neck, L. I.; William J. Chalmers, North Tarrytown, N. Y.; Charles F. Guilloz, Southampton, L. I.; Edmund Newman, Glen Cove, L. I.; Ernest Wise, Bristol, Conn.; Max M. Kumer, New York, N. Y.; Thomas Wilson, Brooklyn, N. Y.; O. M. Eastman, Cleveland, Ohio; William Stephen Fort Erie, Ont.; William Follett, Greenwich, Conn.; Alexander Napier, Red Bank, N. J.

AMONG THE GARDENERS

W. D. Robertson, who recently resigned his position as superintendent of Chieftains, Port Chester, N. Y., accepted a similar position on the estate of E. E. Smathers, Purchase, N. Y., succeeding Joseph Holmes.

Arthur Potter for a number of years foreman at Hammersmith Farm the estate of Mrs. H. D. Auchincloss, Newport, R. I., has succeeded John Mahan, superintendent, who has resigned.

Clunas until recently foreman on the Arthur Curtis James estate, Newport, R. I., is now in charge of the estate of Mrs. Wm. Grosvenor, Newport, R. I.

John Mair, who resigned his position as gardener to Mrs. A. K. Luke, Irvington, N. Y., has accepted the position of gardener on the estate of Mrs. George A. Joslyn, Omaha, Nebraska.

William Cameron secured the position of superintendent to Charles M. Daniels, Sabattis, N. Y.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

M. C. EBEL, Secretary
 286 Fifth Ave. New York

LOCAL SOCIETIES

A number of requests have been received recently to have the reports of meetings of local societies appear in the **CHRONICLE**. These columns have always been open to the gardeners' societies for news not merely of local interest, and we will print all items of general interest to the gardener and his profession.—EDITOR.

SEWICKLEY (PA.)

The regular monthly meeting was held Feb. 8, with President John Carman presiding.

Robert Lloyd, representing the Edgeworth Borough Council, addressed the members in connection with contemplated improvement and beautifying of Way Park, Edgeworth, briefly outlining what it is proposed to do, and solicited suggestions, and the aid of the society. President Carman appointed Messrs. Shaw, Barnett, Gibson and Carman a committee to go over the ground with Mr. Lloyd and make suggestions as to what can be done to the best advantage.

It was decided to hold a flower show in the Fall, and that the co-operation of the Allegheny Garden Club be solicited with this end in view. P. W. Popp, of New York, was a visitor and gave an interesting talk on the cultivation of the dahlia, and also on the aims and objects of the National Association of Gardeners. He pointed out that the day is rapidly passing when the gardener is nothing more than a domestic servant, but a man of professional training and worthy of recognition as such.

Mr. and Mrs. R. H. Boggs, Mr. and Mrs. E. A. Woods, Mr. and Mrs. Clapp were elected to membership.

HENRY GIBSON, Cor. Sec.

OYSTER BAY, N. Y.

The following officers were elected for 1921: John McCulloch, president; John Forbes, vice-president, re-elected to office; Arthur Patton, secretary; John McIntosh, financial secretary; Albert Dawson, treasurer. The executive committee consists of John Sorosick, James Duckham, Joseph Stobo, Leon Lenoir, Robert Honeyman, Andrew Duncan and James A. Andrews. Geo. H. Hale was elected as trustee for three years.

After the election, the outgoing president installed the newly elected officers into their respective chairs. The outgoing president received a pleasing token for the services he rendered the society during the past two years. It was agreed to dispense with the monthly exhibits during January, February and March.

The names of Peter Morrison and George Wood were accepted for the active list.

M. C. Ebel, secretary of the National Association of Gardeners, was made honorary life member. The secretary's report for the year was highly satisfactory, as was that of the treasurer.

ARTHUR PATTON, Secretary.

TARRYTOWN, N. Y.

At the annual meeting the secretary's and treasurer's report showed the society to be in a good financial condition. The society's prizes for the highest number of points gained for exhibits at the monthly meetings

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Japanese Larch, 6 ft., \$6.

Ginkgo, 1½ in., \$3.50; 2½ in., \$6.

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Boxwood Unusually fine, bushy plants.

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2½ ft. Heavy specimens, \$9.

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Virginiana, 6 ft., \$9.

Virginiana glauca, 4 ft., \$10; 7 ft., \$18.

Retinospora

Heath-leaved, 1 ft., \$1.

Thread-leaved (filifera) 2½ ft., \$5.

Golden Thread-leaved, 1½ ft., \$7.50.

Dwarf Hinoki Cypress, 1½ ft., \$2.50.

Sawara Cypress (pisifera), 3½ ft., \$7;

4½ ft., \$9; 5 ft., \$10.

Golden Sawara, 3 ft., \$6; 4 ft., \$8; 4½

ft., \$9.

Plume Cedar (Golden or Green), 1½ ft.,

\$3; 2 ft., \$4; 3 ft., \$6; 4 ft., \$8.

Golden Plume Specimens, 5 ft., \$12; 8

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Silver Cedar (squarrosa), 1 ft., \$2.

Evergreens—Lawn Specimens—Exception-

ally fine plants.

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Scotch Pine, 5 ft., \$6; 6 ft., \$8.

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during 1920 were won by William Jamieson, first; Charles J. Wood, second.

James T. Scott, in a few well chosen words, presented E. W. Newbrand with a purse containing \$50 in gold as a token of high esteem for his untiring energies in the discharge of his duties as secretary of the society, Mr. Newbrand having been secretary of the society 20 years.

Wm. Scott acted as chairman during election and installation of the officers for the year 1921. The following were elected: President, John Mair; vice-president, Chas. J. Wood; treasurer, John Featherstone; secretary, Edward W. Newbrand; reporting secretary, Thos. Wilson.

MONMOUTH CO., N. J.

The regular monthly meeting was held Feb. 10, with President Hicks in the chair. There was an excellent attendance. Three new members were added to our membership. During 1920 each exhibit was scored and totaled at the end of the season, when three prizes were given to those gaining the highest number of points; the successful members for 1920 were James Kennedy, Percy Hicks and W. H. Waite. This method proved successful in keeping up the interest in monthly exhibits, with the result that the same method will be carried out this year.

After the business meeting was dispensed with, W. H. Waite gave us a rare treat with the lantern slides, showing 200 pictures, the work of many years' collecting. The majority of these pictures were color plates, bringing out the true colors of each individual subject. Darwin and Breeder Tulips, and a grand collection of lilies were the predominating features, although there were many other interesting subjects shown. It proved a very pleasant entertainment to all the members present, aside from its educational value.

WM. TURNER, Cor. Sec.

NASSAU CO., N. Y.

At a well attended meeting on Feb. 9 Alex. Mictie, John Power, Frank Power, Frank Kyle, Daniel Cohn, Herbert Bull, Tony Aginlino and John Kennedy were elected to active membership.

The annual dinner of the society will be held on March 15.

The committee on the tulip show reported progress, and with good weather 'round tulip time we should have another record show.

It was decided by the society to take action in regard to the destruction of shade trees in the city streets by linemen of the electric light companies.

A. Herrington, of Madison, N. J., gave us a very interesting talk on the coming International Flower Show, to be held in New York, March 14 to 20; from Mr. Herrington's report it will be the greatest flower show ever held in America. Mr. Sperling, of New York, gave a short talk on the Sweet Pea Show, to be held in New York next June.

ARTHUR COOK, Cor. Sec.

WESTCHESTER AND FAIRFIELD

The regular meeting was held on Friday, Feb. 11. The exhibits were so plentiful that they looked like a flower show. Secretary Addor made a very forceful address on "The Gardener." The next meeting will be known as the secretary's meeting, a new departure from the ordinary routine. Mr.



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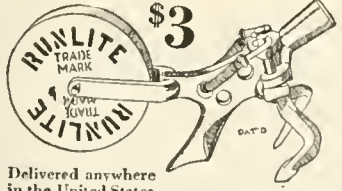
Addor will endeavor to show the members what to do to create interest and make it worth while for every gardener to attend the meetings. It will be well for every gardener to attend. Those who heard Mr. Addor at the last meeting will surely be there and it will afford a chance to those who missed it to hear him speak.

GEO. H. HEWITT, Cor. Sec.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

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SOME OVER-NAMED VARIETIES

The students of pure botany are not the only ones who are having trouble with questions of nomenclature. The chairman of the Nomenclature Committee of the American Gladiolus Society said at a recent meeting that it was once supposed that there were 1,600 different varieties of peonies, but when the different sorts were assembled at Cornell it was found that there are less than 500. All the others are apparently mere names. One variety was found listed under eleven distinct titles. The lists of varieties of peonies, irises, gladioluses, dahlias—in fact of almost any flower that has been "taken up" by the florist—are much too long. To distinguish the desirable forms, it has been suggested that trial grounds be established in which new forms may be tested and, if worthy, named by competent authorities. Something of this kind is badly needed to protect the general public from imposition, also. When one has paid a good price for a specimen he already has, under another name, he is likely to lose confidence in nurserymen generally, to the great disadvantage of both parties.

—The American Botanist.

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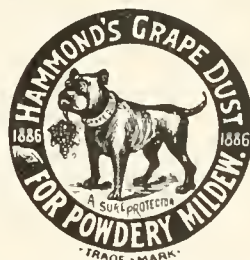
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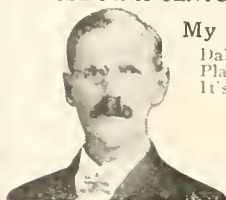
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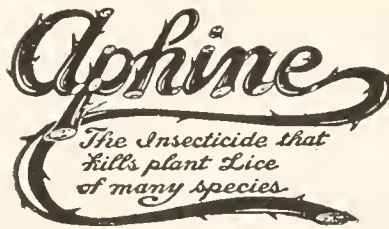
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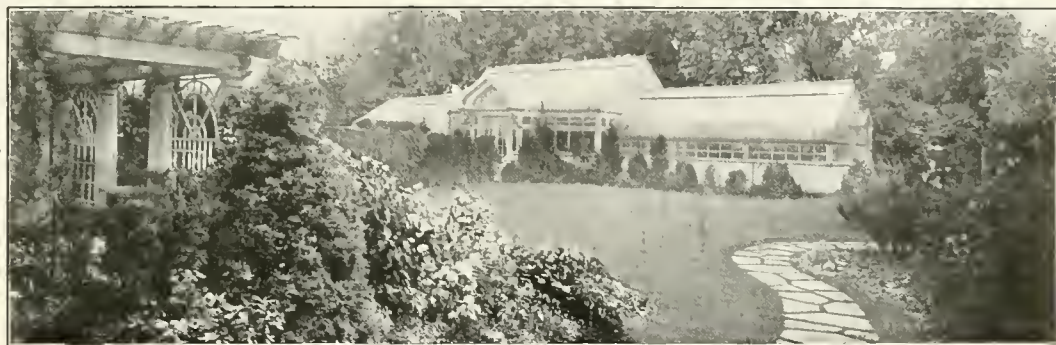
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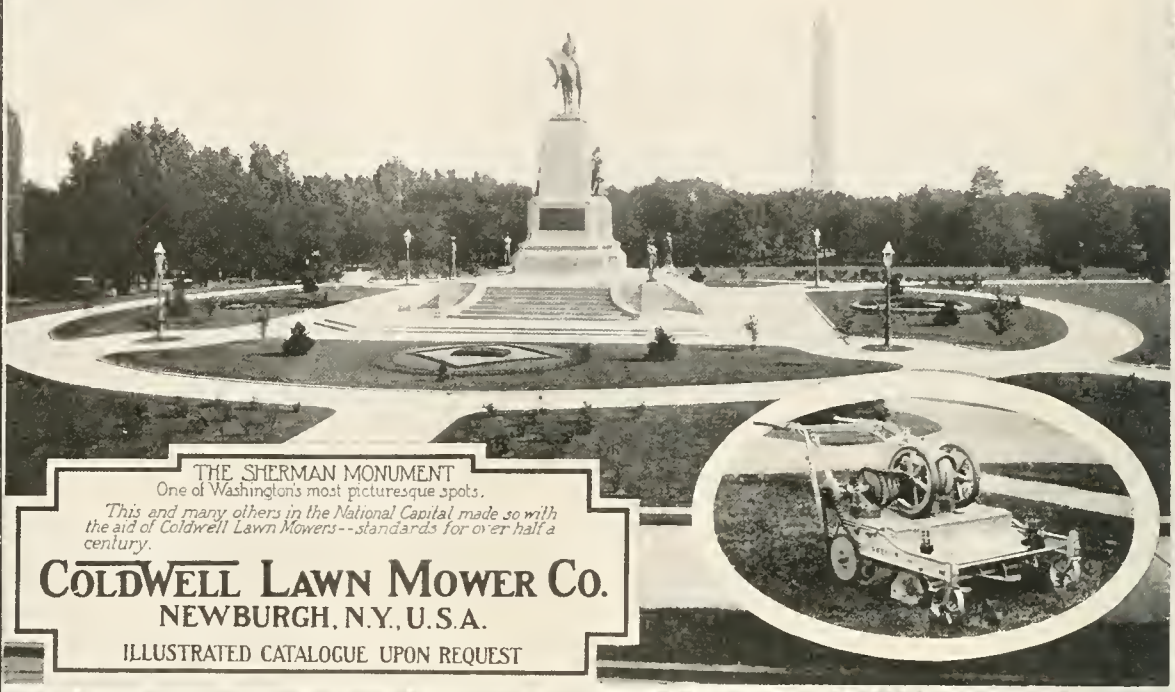
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

APRIL, 1921

No. 4

Things and Thoughts of the Garden

MONTAGUE FREE

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NEW YORK
BOTANICAL
GARDEN

AS a result of the phenomenal Winter we have just passed through, only a short period elapsed between 1920 and 1921 without something or other in bloom in the outdoor garden. There were a few scattered flowers on one or two species of Autumn blooming Crocuses as late as November 18, although it must be admitted they were rather bedraggled, which is not surprising considering that the temperature had fallen as low as 23 degrees on one or two occasions. After a lapse of only three months we again find blossoms out-of-doors, for the Japanese Witch Hazel commenced to bloom in the early part of February. The Chinese Witch Hazel was a close second being fully out on March 7. This in some respects is to be preferred to the preceding but its flowers do not remain in good condition so long. It forms a more shapely bush, has flowers of a more pleasing yellow and is delightfully fragrant. It is one of those plants that are attractive to bees and they were busy, as bees proverbially are, visiting its blossoms during the sunny days of early March. Not being an apiarist I cannot say whether there is any special advantage in providing facilities for the bees to start in business so early in the season, but one would think it would be worth while for bee-keepers to plant the early blooming plants so as to ensure a honey gathering season of the greatest possible length.

The Witch Hazel was not the only plant that was honored by the bees for the Crocuses in the rockgarden were equally popular. These Crocus species are a week or two earlier than the ordinary bedding kinds and for this reason alone are worth planting; and those who do not already have a selection of them in the garden might do worse than remember to order some when the proper time comes. They are so dainty and bright, and possess individuality and character that is often lacking in their more popular relatives. *Crocus Susianus*, *Crocus Tommasinianus* and *Crocus Sieberi* were the earliest arrivals, their flowers being open on March 7. The first named is a dark yellow species marked on the outside with lines of dark purple. The other two are lavender of varying shades, the colors in *Crocus Tommasinianus* in general being of a paler tint than those of *Crocus Sieberi*. *Crocus versicolor* striped and feathered with purple on a white or cream ground color was also in bloom on this date.

Close on the heels of these precocious wildlings came *Crocus stellaris*, of a pale clear yellow; and *Crocus pulchellus*, delicate and fragile appearing, of clear lavender. Accompanying them the Spring Meadow Saffron, *Bul-*

bocodium vernum, displayed its rosy purple flowers unadorned with any sign of leaf-growth. This is a native of the European Alps and is an excellent rockgarden plant, coming up year after year in perfect health. Robinson states that it is earlier than *Crocus Susianus*, but, for this season at least, it was caught napping and arrived a week or so behind.

Erica carnea, to my notion far the best of the hardy heaths, showed a few open flowers on March 7 but was not fully in bloom until the following week. This is a native of the Alps and produces an abundance of rose colored blooms in early Spring which are very lasting. There is a white flowered form which, with us, does not bloom so freely as the type. These are probably the easiest of all the *Ericas* to grow and they seem to succeed in almost any kind of soil.

The flower buds of *Cornus Mas* were showing color earlier than usual this year and it was in full bloom by the middle of the month. It is a wonder that this charming little tree has not been developed with a view to using it in the fruit garden. Its handsome red fruits are fully as meaty as those of the average cherry, and, to most people, are palatable, especially to those who prefer snap and acidity in their fruit. Loudon states that it "bears handsome fruit, which were formerly made into tarts and *rob de cornis*." The wood is very hard; and Evelyn says "made into wedges, it will last like iron." *Rob de cornis* is a sweet fluid extract, presumably used in medicine. The berries are said to be used in Turkey for making a kind of sherbet.

In all probability it could never be made much of a success as a fruit tree in the North, for, by blooming so early, it is exposed to late frosts which prevent the formation of fruit. At least that seems to be the most plausible theory to account for its non-fruiting. I have had trees, here in Brooklyn, under observation for the past seven years and on only one occasion, six years ago, has a good crop been produced, although they have flowered freely each year. However, in sections not subject to late frosts it seems to possess possibilities that should interest the fruit culturist.

One of the early comers in the Spring, that is all too seldom seen in gardens, is the Spring Adonis, *Adonis vernalis*. It has beautiful fern-like foliage in which the bright yellow flowers nestle. These have the typical buttercup structure, with numerous achenes and stamens, but differ in the petals, which are numerous and shaped like those of the Field Daisy. It is a good plant for the

perennial border but is usually grown in the rockgarden where it is not so likely to be overgrown by coarser plants. At Kew it was used as a pot plant in the far famed Alpine House and even when past the flowering stage it was attractive because of its finely divided, dark green foliage. Another seldom seen member of this genus, which possesses some merit as a garden plant, is the "Pheasant's Eye," *Adonis autumnalis*. This, as its name implies, is a Fall bloomer. It is an annual and its flowers are bright scarlet.

The Glory of the Snow, *Chionodoxa*, was in bloom by March 20, and the pale purple flowers of *Saxifraga crassifolia* were opening well down amongst its leathery foliage. The bright red coloring of the buds of *Prunus Conradina* was showing and the interesting *Daphne Mezereum* was in full bloom.

That charming bulbous Iris from the Orient, *Iris reticulata* and its variety *Iris reticulata Krelagei* were in bloom at this time. The type is violet scented, violet in color, with striking golden markings on the falls. *Iris Krelagei* is purple and not quite so pleasing. Presumably, *Iris reticulata* is one of those plants that Quarantine 37 renders difficult to import, for it was missing from most of the bulb catalogs issued last Fall. Fortunately it succeeds well in our climate and its propagation here should present no great difficulties. In our rockgarden a few bulbs were planted about four years ago. Some of them have produced offsets so that we have sizable tufts of foliage and flowers; the remainder are represented by spindling leaves and no flowers, the results of unintelligent plucking by visitors, who, in their anxiety to secure a bouquet, roughly grab the whole plant, leaving behind only the bulb, which, likely as not, has its roots severely injured by this maltreatment. The loss of leaves at this period of their growth of course prevents the manufacture and storage of food in the bulbs; and the result is that growth the following season is weak or lacking entirely. There seems to be no diminution of vandalism in our public parks and gardens in spite of efforts to educate the public to a proper regard for plants and flowers that are the property of all. It is heartbreaking sometimes to find the results of the labor of months destroyed by the efforts of irresponsible children, or by thoughtless or ignorant adults.

* * *

One does not usually think of the Maples as "flowering" trees but some of them, whilst perhaps they do not merit the term showy, are really attractive when in bloom. When travelling from New York to Newport via the Shore Line about the middle of the month it was noticed that the Red Maples, *Acer rubrum*, were the only trees that showed much signs of life. Their twigs, arising from branches of a color approaching a battleship gray, were arrayed in red blossoms which caused them to stand out strikingly from amongst their seemingly lifeless neighbors. This maple is recommended as a street tree and specimens to be seen in Greater New York, mostly in the suburbs, warrant this recommendation. It is probably not so tolerant of city conditions as *Acer plantanoides*, the Norway Maple (which, too, is conspicuous when its greenish yellow flowers are displayed), as it requires a moist soil for its development. In some respects, however, it is to be preferred to the Norway Maple. It is not so low headed, which is sometimes a desirable feature in city streets, and it is distinctly more handsome. In cities where there is not too much smoke, dust, and gas and where its roots are not too much boxed in with asphalt and pavement it should receive the preference over the Norway Maple. Its beauty is such that it is fit to grace any situation where trees are used.

The orange and red coloring of its leaves in the Fall is preeminent even in a genus famed for its Autumn coloration, and, coming in between the displays made by flowers and foliage, the delicate rose of the fruits in their young state form an attractive picture against the foil supplied by the green leaves.

The Sugar Maple, in addition to the gastronomic joys that it provides, gives us æsthetic pleasure when it unfolds its yellow flowers on long, drooping peduncles about the same time that its leaves appear. Many of the Japanese Maples, usually planted with no thought but for the beauty of their leaves, have immensely attractive flowers which are the more noticeable because borne on trees or shrubs of low stature well within the range of vision. Many folks of the lay persuasion comment on these interesting looking flowers not realising they are looking at a Maple.

* * *

Our British friends seem to have been doing great things with the perennial Asters or Michaelmas Daisies during the past few years. The Royal Horticultural Society conducted a trial of these favorite Autumn blooming plants at the Society's gardens at Wisley during 1920. No fewer than twenty-eight varieties received Awards of Merit; thirty-three were Highly Commended; one Commended; and one, *Aster amellus* "King George," was awarded a First Class Certificate—an honor but seldom given. *The Gardeners' Chronicle*, London, issued a colored plate of the latter in the number for Dec. 21, 1918, and one can readily see the justice of the award. It has bright blue-purple flowers three inches in diameter and according to the description appended "has a very neat habit of growth and with good cultivation there is no difficulty in obtaining specimens a yard in diameter." "Beauty of Colwall," an older variety, a form of the New York Aster (*Aster Nova Eboracea*), received a First Class Certificate in 1907 but had its award reduced to A.M. in the 1920 trials which may be taken as an indication of improvements made in this class of plants of late years. This is a variety that is catalogued by United States nursery firms. It has lilac-blue double flowers and grows about four feet in height.

A recent illustration in the *English Gardeners' Chronicle* of a row of the variety "Mons" growing at Aldenham Gardens gives one an idea of the capabilities of growth possessed by these plants when given liberal treatment. Those pictured have a height of about three feet six inches and must be over four feet in diameter. This result was obtained by planting them about four feet apart and removing all but three or four of the strongest shoots on each plant. This suggests that other of our hardy perennials could with advantage be thinned out more severely than the usual practice allows.

Many of these wonderful Asters are varieties of the European *Aster amellus* but a large proportion are descendants, or hybrids, of our native species such as *Aster Nova Anglia*, *Aster Nova Eboracea*, *Aster diffusus*, *Aster ericoides*, etc. Many, if not all, of these new forms were originated in Europe. It is an indication that has been commented on before, that our plant breeders have been neglectful of material actually within our gates, or, that there has been a "let George do it" spirit in this connection.

The photographs and descriptions of the new Michaelmas Daisies that have recently appeared in the horticultural press are sufficient to make any true gardener's mouth water and to engender the hope that they will soon make their appearance on this side of the Atlantic. Their beauty and the ease with which they may be propagated and grown should then ensure for them a wide and swift distribution.

Annual and Biennial Plants—Some of Their Uses

ROBERT CAMERON

TO make this subject more interesting, I shall have to deal with it broadly; first dealing with the origin of annual plants, geographical distribution, the improvement by selection and breeding, importance of good seed, cultivation of annuals, pleasing arrangement in the flower, garden, etc.

Some of you may say, "Why take up these subjects, we only want to know about the culture and arrangement of these plants?" There is just this to say, that the gardener must be conversant with everything that is known about plants to keep up with the progress of gardening in this country. With this information it is much easier to know what treatment to give to the various plants, hence the reason of taking up geographical distribution.

You are all well aware that herbaceous perennials have been much more popular than annual plants. The principal reason given for this popularity is that perennials had not to be planted each year and that after being planted once, they needed very little care. This is all humbug. A perennial garden to be successful needs just as much care as annual plants require, as you all know that there are no plants in cultivation but need attention and the more one gives to them the greater will the success be. This applies to plants indoors as well as out of doors. Consequently, annual plants need no more work or care than any other plants and as to showiness and floriferousness, we have nothing to compare with them.

Annual plants give more pleasure to a larger number of persons, are less expensive, easier to grow and give quicker results than any plants that are grown in our gardens. They are the poor man's as well as the rich man's. They are not like the orchid family which can only be grown by the wealthy. They are, in fact, the real plants for the masses. There is no excuse for the poorest people to be without flowers, for if they do not possess any land, they surely can get a flower box.

To discuss this subject I will have to include biennial plants because they are so important in our gardens and throughout this discussion I will have to speak frequently of herbaceous perennials.

An annual plant from a horticultural standpoint is a showy flowering plant which lives but one season and consequently requires to be raised from seed each year.

A biennial is a showy flowering plant which is produced from seed in one year and the year following it blossoms, ripens its seed and usually dies.

These definitions do not always hold good as there are some annuals that can be kept longer than one year if restrained from flowering. There are some plants that are called annuals that are perennials in their native countries but we raise them each year from seed, hence the reason for calling them annuals.

Although this paper is supposed to be confined to showy flowering annual plants, we should not forget how important the economic annuals and biennials are. Are not most of our garden and farm vegetables annuals and biennials? I am not quite sure but annual and biennial food plants are of more importance to man than those obtained from perennial food plants.

ORIGIN OF ANNUALS.

No doubt some of you have wondered, as I have, why Nature gave such a short period of time to these plants

to complete the cycle of life, while to others she has given an almost indefinite time to live. Why are they so short lived and have they been always annuals? These are puzzling questions and very little has been written about them.

We are told by scientists that flowering plants have come to us from a remote period, from the higher Cryptogams, such as Selaginellas and Lycopodiums; that the Gymnosperms such as *Coniferae* and *Cycadaceae* were probably the first plants to produce seeds; then probably came the woody trees and shrubs, and after that the herbaceous plants, and no doubt after these came the annuals and biennials. To answer the question as to why they are so short lived—it probably came about in this way: At one time, where these plants were growing they were about to be driven out of existence by some agents—probably by cold in cold climates and by drought and heat in dry and hot climates. When a plant's life is in danger it always tries to reproduce itself. Therefore these plants under those hard conditions flowered early and produced an abundance of seeds which carried them through the trying seasons and they were able to again reproduce themselves when congenial conditions prevailed. Doing this same thing for many years they inherited this mode of reproducing themselves annually from seed, and were saved in this way from extinction. This change did not take place all at once, but required a long period of time. The whole question is one of environment and inheritance.

THE GEOGRAPHICAL DISTRIBUTION.

We hear a great deal about trees and shrubs that come from China and Japan to adorn our gardens. I wish to point out to you that in having a garden of annuals you can not only have plants from the temperate regions, but you can also have plants from every tropical country in the world. The annual plants we have in our garden come from all parts of the world and any one who loves variety in the garden cannot get along without them. They are not like the herbaceous perennials of which we can only grow such kinds as come from cold climates that will stand our severe Winter.

Let us look at a short list of the most important genera so that we can see how our Summer gardens are supplied.

From the East Indies have come *Amaranthus caudatus*, *Cacalia coccinea*, *Celosia cristata* and *pyramidalis*, *Dolichos* different species, most of the annual gourds, *Impatiens balsamina*, the balsam, and *Thunbergia alata*.

From China we have *Callistephus chinensis* or China Asters, *Dianthus chinensis* and *Perilla nankinensis*.

Australia has given us *Acroclinium roseum*, *Ammobium alatum*, *Brachycome* or Swan River Daisy, *Caphalipterum Drummondii*, *Didiscus corleus*, *Helichrysum*, *Heliopsis* or *Rhodanthe*, *Podolepis gracilis* and *Wahlenbergia gracilis*.

Africa has given us *Arctotis*, *Cryptostomma*, *Dimorphoteca*, *Hebenstretia*, *Lobelia erinus*, *Linum grandiflorum*, *Malope*, *Nemesia* and *Senecio elegans*.

Mexico gave us *Ageratum Mexicanum*, *Argemone Mexicana* and *grandiflora*, *Cosmos bipinnatus*, *Lophospermum scandens*, *Maurandya Barclayana*, *Sauvitalia*, *Tagetes erecta* and *patula*, *Zinnia elegans* and *Haageana*.

From Europe, *Antirrhinum majus*, *Calendula officinalis*, *Centaurea cyanus*, *Convolvulus tricolor*, *Delphinium*

ajacis and *consolida*, *Iberis coronaria*, *odorata* and *umbellata*, *Lathyrus odoraus* or Sweet Pea, *Mathiola annua* and *incana*, *Nigella*, *Damascena*, *Papaver Rhæas* and *somniferum*, *Roseda odorata*, and *Scabiosa atropurpurea*.

California gives us an immense lot of good annuals, *Abronia*, *Baria*, *Bartonia*, *Clarkia*, *Coreopsis tinctoria* and *Atkinsoniana*, *Eschscholtzia*, *Eutoca*, *Gilia*, *Godetia* (*Oenothera*) *Lasthenia*, *Leptosyne*, *Nemophila*, *Oenothera* and *Phacelia* (*Whittlavia*).

Coreopsis Drummondii and *coronata* and *Phlox Drummondii* come from Texas.

It will be seen from the above that the whole world contributes to our summer display.

IMPROVEMENT BY SELECTION AND BREEDING.

Although many of our annuals are extremely beautiful in their wild state, there have been most wonderful changes brought about in some of the genera and species by cultivators and specialists. Annual plants have been of much more interest to those who have been interested in the improvement of cultivated plants, than herbaceous plants have ever been. They have been more easily handled, that is, their habits and forms have more easily responded to the requirements or desires of the improver. On the other hand they have had other drawbacks which the improver found great difficulty to overcome in many instances. To get a new habit or new form of flower in annual plants was not the only difficulty the improver or cultivator had to contend with. His time and skill would have been wasted if varieties could not be produced true from seed. Therefore it is in getting good strains that will come every time from seed that takes time, patience and perseverance. In woody or herbaceous plants this difficulty is much more easily overcome when new varieties have been obtained, as they can be increased in many ways other than by seed, such as by cuttings, grafting and many similar modes of propagation. Consequently much time and trouble have to be given to keeping true the fine strains of many kinds of our garden annuals. They very soon degenerate and, if not carefully looked after, many of them will revert to their wild state. One would be almost safe in saying, that if the skill and labor of our cultivators and specialists were abandoned for a few years, nearly all good varieties of garden annuals would disappear and be replaced by inferior kinds more like the original wild forms.

Wonderful improvement has taken place since the garden annuals were collected in their native countries. The time and labor that has been spent on some of these plants is hardly credible. The history and origin of some of the varieties make intensely interesting reading.

Some men have spent the best part of their lives improving the species and varieties of one genus. Eckford and Laxton in England gave the greater part of their lives to improving the sweet pea. In Germany, France and England much time has been spent in raising and improving these plants. The trial grounds which cover hundreds of acres of some of the large seed growers in Europe show us what is being done with this class of plants. I shall never forget the impression created by the apparently endless beds of annuals at the extensive grounds of the Messrs. Sutton of Reading, England, when I visited their establishment some years ago.

Hardly any of us ever give it a thought when we are enjoying our beautiful plants in our gardens as to how these plants originated in the plant world.

IMPORTANCE OF GOOD SEED.

In my opinion, it is always best to buy the very best strains of seed obtainable, even if they cost more. There

is less work and care with good, fresh seed than there is with cheap, unreliable kinds. The cheap seed needs as much care and attention as good seed does, and never gives as good results. No doubt you have all noticed in Spring when the weather begins to get warm and when man begins to think he ought to get back to the soil, how quickly seed stores multiply; they grow up like mushrooms. At that time you will see displayed in the windows of druggists, grocers, bakers and such places, boxes of annuals with pictures of flowers of the most brilliant colors imaginable. If anyone wants to get results, my advice would be to shun these places and buy seeds from reputable seedsmen who have made a life study of the seed business. They can not afford to sell you unreliable seeds.

Many of the annual seeds lose their germinating power much earlier than other seeds, therefore it is very important that they have been freshly collected the previous year. Those seeds sold by grocers and such like people are old and unreliable. The cheaper the strain the more plants you will get. From the finer and more expensive strains fewer plants are obtained but one gets quality against quantity. Some of you will be surprised to know that in France and Germany some of the growers of fine strains of pansy seed sell their products weight for weight, that is, one ounce of pansy seed for one ounce of gold. So it is easily seen from this that fine strains of seed are "Worth their weight in gold."

CULTIVATION OF ANNUALS.

There are no plants easier to grow than annuals, but the easiness of culture has drawn many people into the habit of growing them in a haphazard way and often they do not receive the attention they deserve. To obtain good results we have to give them just as good care as we give to other garden plants. Then the luxuriance of growth and the plentiful supply of flowers pay us amply for the extra care.

It is a great mistake to think they will grow in any kind of soil. The majority enjoy a good rich, loose, open soil, and most of them are great lovers of sunlight. Therefore, they should be given position where they can get plenty of light.

In Nature we find that most of the annuals are sown in the Fall and in Europe many of them are sown in gardens at that time in warm, sheltered spots where they will bloom early in the Summer. Very few of our very hardiest annuals will survive our severe Winters in this part of New England in the open ground. I have tried quite a number of them but the results were unsatisfactory. Many of them will stand until Christmas or thereabouts, and after that they disappear. The alternate freezing and thawing seem to do the injury.

For Spring bedding we raise quite a number of kinds and Winter them in cold frames. The seeds are sown in August and the young plants are set out in the beds whenever the frost is out of the ground in Spring.

There are several ways of raising or growing these plants but the time when the display of blossoms is wanted must to some extent determine the time to sow the seeds. If they are required for early decoration in the garden they may be sown in the greenhouse as early as March or April. The seeds are sown in pots or boxes which are filled with moderately light fine soil. The covering of the seed is of importance as some kinds when covered too much never germinate.

Very small seeds such as Begonias, Torenias and such like need hardly any covering. Large seeds should be covered more heavily, a good rule being to cover the seed to the depth of their diameter. There are some large seeds which require a deeper covering.

When the seeds have germinated and the seedlings are large enough to handle they should be pricked off into boxes of moderately fine soil, after this they are shaded for a few days during the hottest part of the day. In a short time they are large enough to be boxed off or else potted off singly into small pots. Very soon they are large enough to be put into cold frames where they are hardened off to plant out of doors in May.

Where there are many kinds of annuals raised in this way in the Spring, should the weather happen to be dull there is sure to be "damping off." The best way to stop this is to prick the seedlings into boxes or pots of fresh soil.

Another way to obtain plants earlier than those raised out of doors is to sow the seeds in cold frames. When the weather is warm enough the young plants may be transplanted from the frames into the ground where they are to blossom. The transplanting should be done when the weather is moist.

The best and most popular way to raise these plants is to sow the seeds where the plants are to be grown in the garden. The ground should be put into good condition by digging and enriching and made fine by raking before the seeds are sown. Very often the seedlings come up too thickly and thinning the plants out is one of the most important points in their culture, the neglect of which does more to injure them than anything else. When sown thickly and allowed to run up into flower without ever being thinned, great disap-

pointment will often follow. Thinning out the plants should be begun just as soon as they are large enough to handle.

Sowing should begin outdoors with the most hardy kinds whenever the frost is out of the ground. In fact there are some kinds which are a complete failure if not sown early; such, for instance, are Sweet Peas and Poppies. The kinds that are more tender should not be sown until the ground is gaining warmth, about the middle of May.

There is another point in connection with these plants that is very important and often neglected; that is, removing all decaying blossoms and preventing seed from forming. If this is not attended to the season of blossoming is very much shortened. If this is constantly seen to the energies of the plant are put towards the production of growth and flowers, and the flowers are finer and are produced more abundantly. Watering and stirring the soil are two factors which must be attended to regularly.

The large growing kinds will require staking and this should be done as neatly as possible. There are very few people who have the knack of staking outdoor plants successfully. The staking of plants in the garden shows at once the intelligence or the indifference of the gardener. Every plant has a certain defined contour of its own and the aim should be to imitate it as near as possible.

Read by Robert Cameron, Supt. Castle Hill Farm, Ipswich, Mass., before Gardeners' and Florists' Club of Boston, March 15, 1921.

(To be continued in the May issue.)



Exhibit of group of Flowering Plants, occupying five hundred square feet, staged by John Canning, superintendent to Adolph Lewisohn, at the International Flower Show, Grand Central Palace, New York. Awarded First Prize, and Gold Medals of the National Association of Gardeners, Garden Club of America, and International Garden Club for the most meritorious exhibit by a private grower.

The Modern Violet (Violaceæ) Its History and Culture

CHARLES MILBURN

VIOLACEÆ is a beautiful and well-known family, the flowers of which are among the most attractive subjects of our rock and Alpine gardens, and is found in many parts of Europe, the Alps, Sweden, the Pyrenees, and our own United States.

From the violet, most of the wild flowers of northern England derive their beauty and delicate fragrance. No family has given us anything more valuable than the garden pansies and *Violas* or tufted pansies (*Viola lutea*) found along the hedgerows and pastures of northern England and Scotland.

Viola tricolor, a native of the Old World, is the wild species from which the many varieties of pansies and violets seem to have been developed, and the most beautiful of them all is the large single violet, Princess of Wales.

A successful grower of violets must give the careful attention necessary, as the erratic climatic conditions of this section are very trying for the plants. The soil should consist of moderately sandy loam, with some clay, preferably from an old pasture, and stacked in a compost heap with well rotted manure, mixed in the proportion of one part manure to four parts soil. Before putting in the houses or frames, the soil is thoroughly worked over with about twenty-five pounds of unslacked lime added to the soil for three hundred plants. They can be planted in solid beds or raised benches, or in frames. The writer has used all these methods with success, both in the North and in the vicinity of Washington, D. C.

Violets are propagated by division of the crowns, and by offshoots or runners, which are rooted in sand. These runners or cuttings are taken in late Winter or early Spring, without disturbing the old plants. At the end of the flowering season, usually around April 15, the old plants may be split into several pieces, with roots attached, and planted into small pots. The rooted plants are planted in the garden in May about eight inches apart in ten-inch rows for double violets; single Princess of Wales, twelve inches apart in twelve-inch or eighteen-inch rows. Abundant water is needed in the growing season. The runners are cut off, not torn, and every effort made to secure strong, healthy plants by Fall.

Some varieties require a heavier soil than others, and a thin mulch of fine, well-rotted cow manure may be given in August. The plants are syringed through Summer and early Fall, as a deterrent to red spider, but by the middle of October this must be avoided.

Constant work is needed in keeping the beds clean; weeds, dead leaves, and abortive flowers are all removed, and burned, for their presence invites disease. Runners and dead leaves are always cut off; to tear off, invites fungi to work on the lacerated tissue.

About the middle of October the plants are lifted carefully, and planted in the greenhouse or frames, as the case may be, and carefully watered and cultivated, but they should never be sprayed overhead in cloudy weather.

Frame culture consists of lifting the plants that have been grown outdoors, around the 15th of October or 1st of November, to the frames twelve inches by twelve inches apart, for Princess of Wales, and cultivating as long as fine open weather continues. Around December 1, manure should be banked around the frames, and double sash glass placed over them for the Winter, which will keep them at the proper temperature of forty or forty-two degrees in zero weather. They should have abundant ventilation and water on all bright days. As the sun begins

to gain in strength towards Spring, the grower will be rewarded with very fine large fragrant flowers about an inch across, which should be picked daily, until they become exhausted in late Spring.

Eternal vigilance, good judgment, and an open location, where the plants can get plenty of ventilation (they are cool weather plants), are the factors for success in violet culture, but weak or diseased parent stock will nullify the most intelligent work. Men of experience acquire a knowledge of the plant that cannot be obtained from books, and thus appear to have some secret that is, after all, only acquired by hard work and close observation. Violets must be picked fresh daily, as they are evanescent.

The varieties of the sweet violet (*Viola odorata*) are very numerous. There is a single white, a single rose, a double white (the Czar, a very large and sweet variety, much grown in England), the Queen of Violets, La France, California, Loxonne, Princess of Wales, Belle de Chatenay, Lady Hume Campbell, Marie Louise, Swanley White, Gov. Herrick, Victoria Regina, etc., and a perpetual blooming violet, well known in France as La Violette des Quatre Saisons. This variety differs from the true violet or sweet violet, but is valuable for its long season. It is the variety used by gardeners around Paris, which is grown on a vast scale, many acres being covered by these flowers, which are also shipped to Covent Garden, London, and from there to all parts of England.

Marie Louise is a very good kind, and a great advance upon the old Neapolitan, but Princess of Wales, a fine single, with an exquisite fragrance, surpasses them all.

Other species are *Viola pedata* (Bird's Foot Violet), the most beautiful of our own American violets.

Viola reniforme (New Holland Violet), a native of Australia, with white flowers about two inches high.

Viola rothomagensis (Rouen Violet), with purple and white flowers, a native of Sicily.

Viola tricolor (Heart's Ease) is known as the pansy, with its many colors and combinations of colors, which in all probability descended from *Viola altaica*.

One of the most common weeds of Scotland is the wild violet (*lutea*).

Viola biflora (Two Flowered Yellow Violet) is found in the Alps, and is useful in rockgardens.

Viola calcarata (Spurred Violet) is also an Alpine plant, with white, lilac and yellow flowers.

Viola cornuta (Horned Pansy) is now a favorite in England, which has several named varieties.

Viola cucullata is our own American violet, which resembles the common violet without fragrance.

Other species are *gracilis*, *lutea*, *Munbyana*, *valderia*.

Grown under glass, violets are often injured by a small maggot, that causes the edges of the leaves to curl and turn yellow and die. The adult is a very minute fly, resembling a mosquito. Pick off and destroy the infected leaves, and fumigate with hydrocyanic acid gas. Other troublesome pests are black fly, green fly, gall fly, violet saw fly, greenhouse leaf tyer, and red spider. An anthracnose and a root-rot, especially destructive to young plants transplanted in hot weather, is controlled by sterilization of the soil, and by using a solution of formaldehyde.

Hardy Primroses

RICHARD ROTHE

THE overwhelming majority of our advanced garden and flower lovers know and like hardy primroses. There is no lack of appreciation of the charm of the English cowslips, *Primula vulgaris*, and the oxlips, *Primula elatior*, enlivening the floral Spring aspect of woodland and meadow abroad. Indigenous in Europe and temperate Asia, frequently abounding within moun-



Primula denticulata grandiflora

tainous regions of high altitude, with scarcely any species of the genus *Primula* as native of our northern hemisphere existing, we must look at them as foreigners requiring congenial climate and suitable exposures for perfect development. Hardy primroses, as a rule, do very well in New England gardens and all along our northern border line. In the Middle Atlantic states we usually succeed if we give our plantations light shade during



Primula elatior lutea

the midday and early afternoon hours. Most species prefer a more or less moist situation and, for that reason, thrive remarkably well along the waterline of brook and pond. If the banks happen to be high and slopy it is best to avoid the south and southwestern inclines. Exposed to the full force of our mid-Summer sun the foliage suffers, the growth stops and with stunted plan-

tations we are going to have inferior flowers the following Spring. Planted in light loamy soil, the beds well enriched, primulas do not need more than average care. They are easily raised from seed sown under glass in Spring. Old plants may be divided in mid-Summer. For Winter protection we use old manure or leaves.

When studying the achievements of the European hybridizers in improving hardy primroses, noteworthy are those on the *elatior* and *acaulis* types, we can hardly refrain from growing envious. It is not alone the remarkable size and the clear and vivid colors, but also, the great abundance of flowers produced during a period of over a month and a half, which we are forced to admire. Both types run in white, yellow and in various shades and combinations of red. As an exception I mention *Primula acaulis carulea*, a clear blue variety. In my estimation the single forms appear preferable to the doubles. Artistic amateurs treasure *Primula elatior lutea* and *alba* very highly for choice vernal color arrays, both for garden and rockery. The same popularity is shared by *Primula Sieboldi*, a species from Japan and



Primula auricula

the Transbaikal regions, with new garden forms appearing in white, pink and purple. Equally effective are the flowers of *Primula Vitchii*, a native of China, distinguished by their deep rose color and yellow center.

Well do all my older readers remember that old-fashioned, sweetly scented garden favorite, *Primula auricula*. Today, European catalogs invite us to get acquainted and enjoy the results of a half a century's selecting and sifting of the very best in color, and otherwise perfected by scientific plant-breeders. The *Luiker* and, for size of the flowers, more so the *gigantea* strain of the species *Primula auricula* contains combinations of rich velvety shades and tints never seen before. Our picture originated on Mount Desert Island, Maine. If nothing more it bespeaks the splendid possibilities of northern plantmen for the growing and cultivating of hardy primroses.

Of the section distinguished by densely-set round or globular flower heads, *Primula capitata*, hailing from the Himalaya, and *Primula cashmeriana* have been always classed among the rather rare and choice things in gar-

(Continued on page 543)

Walks and Talks Among the Spring Flowers

FLORUM AMATOR

AS we renew our garden walks and talks now in mid-May, the garden beds and borders, the rock-gardens, and the wild gardens are becoming increasingly gay each day with blossoms whose sweet perfumes fill the air. If we were permitted to live only three months each year in the north temperate zone and had to lie dead in our grave the remaining months, we would certainly choose to live in May, June and October.

How stately these Darwin Tulips are! What a wide range of colors we see in their cup-shaped flowers with obtuse petals, all colors except yellow. We see blue, white and black, but never yellow markings, at the base of their petals inside. Here too we see the beautiful May-flowering or Cottage Tulips and among these we see a fine yellow variety, the Inglescombe yellow. This type of Tulips, we note is not as tall as the Darwins; their flowers in general smaller, and though some have obtuse, most have pointed petals, and a chalice form and inconspicuous yellow marking at the base of the petals inside. Not far from these two types, we find the Dutch Breeder Tulips. What wonderful color combinations their flowers have! Note these soft blendings of buff, purple, terra-cotta, maroon and bronze. Here are other types still of these lovely late Tulips, the Rembrandts and Bybloemens, the Parrots and the Bizarres. The Rembrandts, we note, are only oddly striped and feathered Darwins; the "Rose Bybloemens" have beautiful rose, pink and scarlet markings on a white ground, and the "Violet Bybloemens" on the same ground color have blue, violet and purple markings. These Parrot Tulips which we are looking at, are quite different from all other types; their petals are marvelously colored in stripes, and their edges are curiously slashed. These Bizarres differ from the other types in that they have yellow ground colors, variegated with crimson, purple and white. A notable display of these late Tulips in bloom is seen annually from mid-May to early June in the Botanical Gardens in Bronx Park, New York City.

As we pursue our garden walks, we find in bloom other plants, whose flowers, though not as showy as the late Tulips, are, nevertheless, beautiful to see.

Vying with the Tulips in their claim for colorfulness is this bed of Poppies, botanically known as *Papaver*. This is the Dwarf Alpine Poppy, *P. alpinum*, with large, fragrant, white flowers with yellow centers, and with fern-like leaves; this is the Atlantic Poppy, *P. rufifragum Atlanticum*, with silvery and hairy foliage, and large red orange flowers. Here we see the Hairy-stemmed Poppy, *P. pilosum*, with soft hairs and pale scarlet or clear-orange flowers with white marks at their base. This is one of the gaudiest and largest of all Poppies, the Bracteate Poppy, *P. bracteatum*, whose blood-red flowers with inside marking of purple-black spots are six to nine inches across. Here is another very showy species, the Oriental Poppy, *P. orientale*, whose scarlet flowers marked with black spots within, are as large as those of *P. bracteatum*. Some varieties of this you see here in pink and orange shades, and silvery white. The first is known as Blush Queen, and the last as Silver Queen; these varieties are not as hardy, it is said, as the species. Here are two more strong growing rare varieties of *orientale*, known as Parkman's and Royal Scarlet.

In this wild garden in the half shade we see the Mandrakes, or May Apples, *Podophyllum peltatum*, the native

species, and *P. emodi*, the Himalayan. Their great cup-shaped, waxy white flowers are followed by edible fruit, that of the *peltatum*, yellow, and of the *emodi* red.

In this shady spot are two species of Solomon's Seal, *Polygonatum giganteum*, the Greater, and *P. multiflorum*, the Many-Flowered. Note how their greenish white tubular flowers droop, on gracefully arched leafy stems.

In this half-shaded border we see several species of Buttercup, *Ranunculus*. This is the Aconite-leaved Buttercup, *R. aconitifolius*, with white flowers, and also its more attractive double flowered variety, *R. aconitifolius flore pleno* (known as Fair Maids of France). Here in the sun is the white Buttercup, *R. amplexicaulis*, whose white flowers with yellow centres are borne on slender stems above a gray-green foliage. These are Bachelors' Buttons, *Ranunculus acris flore pleno*, an old-time favorite, with very double golden yellow flowers. This is another variety of the Aconite-flowered Buttercup, *R. aconitifolius luteus-plenus*, with rosette-shaped, double yellow flowers in clusters. This downy plant with solitary yellow flowers is the low growing Mountain Buttercup, pretty in a rockgarden. Here is another neat little yellow Buttercup with a formidable name, the Lesser Celandine Figwort, *Ranunculus ficaria*. In the moist part of this border we see the Creeping Double-Flowered Buttercup, *R. repens flore pleno*, with semispherical double yellow flowers.

This plant growing in the grass comes from a bulb. It is the common Star-of-Bethlehem, *Ornithogalum umbellatum*. This increases rapidly and likes the sun. Note its clusters of many star-shaped white flowers, and its narrow leaves spotted with white.

The several varieties of Tree Peonies, *Paeonia moutan*, the earliest of all Peonies, we see now in bloom. This is the Poppy-flowered Tree Peony, *P. moutan papaveracea*; its large white poppy-like flowers have red markings in the center. All of these Tree Peonies which, you note, are of shrubby growth, and quite different from the herbaceous Peonies, are suitable for growing in sun or shade, in the rich border or the edge of shrubbery. This variety is the striped Tree Peony, *P. moutan vittata*, whose single sweet-scented white flowers are shot with pink. The flowers of this large Rosy-Tree Peony, *P. moutan rosea superba*, are, as its name implies, large and rose-colored, and they are also double. This beautiful variety is sometimes called "Reine Elizabeth" and also "Triomphe de Grande."

The earliest of the herbaceous Peonies are now coming, as we see, into flower. This is *Paeonia officinalis rubra plena*, the common Peony of the oldtime gardens, with double crimson flowers; here also are several varieties of this *P. officinalis rosca-plena*, with rich crimson flowers, and *ancmonae-flora*, having deep crimson flowers with twisted yellow edged crimson stamens.

This group of the several species and varieties of Jacob's Ladder, *Polemonium*, is interesting. This plant growing from six inches to three feet high thrives here in this half-shade. *P. caruleum* has bluish purple, bell-shaped flowers, and its variety *album*, white flowers, and *reptans*, a dwarf variety, flowers of azure blue, and *humile* another dwarf, pale blue flowers.

In this half-shady spot are two species of squills, *Scilla*, and several varieties of each, *Scilla festalis alba*, having drooping, bell-shaped, fragrant white flowers;

dens. The color of the former is a deep violet blue, while the round umbels of the latter appear light purple. The foliage of *cashmeriana* is pale green, the lower surface covered with a powdery substance resembling gold dust. Less delicate and therefore far better adapted for our climate is *Primula denticulata*, a hardy and very showy species *sikkimensis* it is decidedly moisture-loving. The *P. festalis cernua*, with purplish-pink; *P. festalis lilacina*, with lilac, and *P. festalis rosea*, with pink flowers; also *S. Hispanica alba* having fragrant, drooping, bell-shaped white flowers; *S. Hispanica carnea* with flesh-colored flowers and *S. Hispanica rosea* with rose-colored flowers.

This plant which we see growing in the full sunlight, but which will grow in the half shade also is the greater Starwort, *Stellaria holostea*. This is useful as well as pretty, as it will form a covering for dry banks on which grass will not grow; its leaves are small and its white flowers numerous.

Here are several species of *Thalictrum*; this is *Thalictrum aquilegifolium*, commonly called Feathered Columbine, really not a Columbine, yet, so called because its dark, handsome foliage is like that of a Columbine, but its feathery, white flowers borne in large clusters are quite unlike those of Columbines. This is an excellent plant for the border or naturalizing in sun or part shade. This other species, *T. purpurescens*, is commonly called Purplish Meadow Rue, a tall plant, and its loose, leafy panicles of greenish white flowers are in keeping with its height. For a wild garden this Glaucous Meadow Rue, *T. glaucum*, is very suitable; its greenish yellow flowers are in dense clusters, and its fern-like leaves enhance its beauty. Though its greenish yellow flowers are insignificant, the grayish foliage, resembling that of the Maiden-Hair fern, make this Dwarf Meadow Rue, *T. minus*, desirable for an edging or border.

These plants are the Spiderworts, *Tradescantia Virginica* with purplish flowers, and *T. Virginica alba* with white; free growing, bushy plants, with many flowered umbels; a plant of easy culture in sun or half-shade.

The American Barrenwort, *Lancoueria hexandra* grows well massed here in the shade of the trees. It is grown more for its pretty, fern-like foliage than for its small white flowers. This is a Pacific Coast plant, and has of late years been collected in Southern California and shipped all over the country and sold to florists as a bouquet green under the name of "Mexican Ivy."

Here in the half shade of this moist border, is a stately, Asphodel-like plant with grassy leaves and a tall stem terminated by yellowish white flowers in close racemes; this is called Turkey's Beard, *Xerophyllum setifolium*. This plant is quite suitable to grow in a peaty bog.

In this sheltered location in the border we see several Columbines, Aquilegias. This is the yellow Canadian Columbine, *Aquilegia canadensis flaviflora*, with drooping yellow flowers raised above its grayish foliage and with it the species itself. *A. canadensis* with an abundance of scarlet flowers, excellent wild or rockgarden plants in either sun or part shade, which is true of most Columbines. Here are many others also, *A. Oxysepala*, the Sharp-Sepaled Columbine, whose large purple flowers are tinged with yellow and white; *A. vulgaris*, the many-flowered purple Columbine, and its double flowered variety *flore pleno*, and its white variety, *nivea*; *A. Stuarti*, Stuart's Columbine, a beautiful, erect species with large lilac blue flowers; *A. Skinneri*, Mexican Columbine, a many-flowered, large, shapely plant with orange-red flowers. These showy drooping scarlet and yellow flowers are those of the Hybrid California Columbine, *A. Californica hybrida*, and these charming, deep blue nodding flowers, whose petals are tipped with cream are those of the Altaian Columbine, *A. glandulosa*; this

beautiful species with large blue flowers whose spur tips are green-tipped and twisted, and whose foliage is large and handsome is the Long-Spurred Columbine, *A. carulea*; here with graceful arching stems we see a most charming species, the Golden-Spurred Columbine, *A. chrysantha*, with handsome dark foliage and many beautiful, yellow fragrant flowers.

It has, we have read, been proposed to make the native Columbine, *A. canadensis*, our national flower, and we think it would be preferable to the Laurel, *Kalmia latifolia*, also proposed for this purpose, parts of which contain a deadly poison.

We will have to stop our walks and talks now, but may resume them either when the "Good Old Summer-time" comes or when the swallows come and the wild geese fly north another Spring.

HARDY PRIMROSES

(Continued from page 541)

of bright lilac and lavender shades adorn the plant during May and June. Our cut, depicting a group of plants of the new grandiflora strain of George Arends shows the recently disseminated white variety at the right.

A perfect gem and yet, scarcely known on our hemisphere, is *Primula rosea*, a comparatively small native of the western Himalayas. Like *denticulata*, *Cockburniana*, *Japonica*, *pulverulenta* and the clear sulphur-yellow species *sikkimensis* it is decidedly moisture-loving. The most charming feature of *Primula rosea* and especially of its garden form, *rosea grandiflora*, is the brilliant carmine pink color of its flowers when planted along waterlines for mass-effect.

In contributing new and beautiful trees, shrubs and perennials for our gardens the flora of the Far East has been lavishly liberal. A complete enumeration and description of the treasures we owe to the French missionary, Abbé Delavay, alone, would mean to write a book. How immensely the recent exploits of E. H. Wilson as plant collector are going to add to the beauty of garden and home ground here and abroad lies still beyond our comprehension. As to the continued influx of novelties of hardy primroses we only need to take a glance at Camillo Schneider's robust growing and marvelously free flowering Chinese species, *Primula Sylva Taroucana*, illustrated in the April issue of *Gartenschönheit*, to notice that the near future is going to bring happy surprises for hardy primrose lovers. Those of the British Islands look today with just pride at George Forrest, the eminent Scotch explorer and collector who, during his prolonged sojourns amid the Alpine section of the southern part of the province Yunnan, in China, has been a contributor of many entirely new forms and species of the genus *Primula* of which the Botanical Garden of Edinburgh was the principal receiver.

When beholding the bright orange hues of *Primula Bulleyana*, and gradually convincing ourselves that the oddly cone-shaped, at the point blood-red, in the middle purple, and at the lower part delicate lavender, flowers of *Primula Littoniana* are really those of a primrose, we wonder what is going to come next.

Hitherto our attempts in bog gardening, when compared with work of the same character abroad, remained more or less crude. Exploiting the enchanting possibilities of rivulet and brook we have hardly begun. However, the prevailing tendency among our refined and wealthy countryside residents to cut loose from every day conventionalism sooner or later will bring opportunities to prove that we are up to the task. Keeping this in mind I believe we can ill afford to remain disinterested in moisture loving hardy primroses.

Spiræas, Their Propagation and Cultivation

DR. E. BADE

ALTHOUGH the species and varieties of *Spiræa* are numerous, few of them can be used as individual plants, the majority of them being best adapted for group planting. If it is desired, one can select *Spiræas* which will flower from April until November, and, as they require but little care, are among the best liked ornamental bushes. This not only because of their showy flowers, but also because their foliage makes them very attractive.

The medium sized *Spiræa Thunbergii* develops dainty flowers during the months of April and May. In the Fall the foliage turns orange and red and thus, for the second time, is very attractive.

The two varieties of *Spiræa salicifolia* are var. *latifolia*, and var. *alba*. The species chiefly occurs in the low, somewhat swampy bottoms of Asia. The flowers, which are

Spiræa tomentosa. The rose-colored flowers are open until Fall. The middle flowers open first, and the others begin to open when the first begin to fade. This species is best adapted for hedges. *Spiræa canescens* covers its



Spiræa bumalda

drooping twigs thickly with white flowers. Still better for this purpose is the var. *myrtefolia*. Both require a more or less protected spot for their best development.



Spiræa thunbergii

rose-colored, open during July and August. This plant often escapes from cultivation.

Spiræa chamaedrifolia, and *Spiræa flexuosa* reach a height seldom exceeding 5 feet. Both develop white umbel-like flowers which appear during May and June. *Spiræa media* and the small *Spiræa corymbosa* flower somewhat later. The latter produces large racemose white flowers. The flowers of the *Spiræa bella* are tinged with red, and this species flowers a number of times during the Summer. It should be placed in a protected spot. During the Winter it is advisable to cover the plant. The young individuals are especially delicate and therefore should be adequately protected.

Rose-colored umbellate flowers are developed during the Summer by *Spiræa japonica*. It flowers far into the Fall. Dark red flowers are produced by var. *atrosanguinea* and var. *punicca*. The large leaved var. *macrophylla* also produces red flowers.

A narrow bush seldom more than 3 feet high is



Spiræa van Houttei

The same place should also be given to the Japanese *Spiræa albiflora*. Placed in such a spot this species will bloom continuously from July. This tiny species is also well adapted for border plants. From a dark to a

delicate rose are the flowers of *Spiraea menziesii* and its varieties. These plants are delicate and should therefore only be planted in well protected places.

Not over three feet in height with beautiful red flowers which are open throughout the entire Summer is *Spiraea bumalda*. This bush grows vigorously and does well in any garden soil. It can be used for borders or for small hedges. The var. "Anthony Waterer" develops darker and larger flowers. If the flowers, when they have bloomed, are regularly removed, then this species develops new flowers and will continue to bloom far into the Fall. The young foliage shows a beautiful spattering of white and red. When it is desired to keep this species small, it should be pruned even with the ground in the Fall. Garden forms to be recommended are, among others, *Spiraea syringiflora*, having red flowers and a dwarfed growth. Also *Spiraea coccinea*, whose flowers are flesh colored. For borders and the mountain garden *Spiraea bullata* can be used. This shrub



Spiraea grandiflora (*Exochordia grandiflora*, Korolkowi)

must be placed in a sunny spot where it will then develop its red hemispherical flowers in rich profusion.

Spiraea van Houttei is a medium sized bush which covers itself luxuriously with snow-white flowers. These make their appearance at the end of May. This plant can be used for both individual planting and for groups, and it develops its full beauty under both conditions. The flowers always make their appearance on last year's twigs. Therefore, when pruning, care should be taken that the young wood is not removed entirely.

The smallest of all the Spiraeas is *Spiraea decumbens*. Its flowers are white and appear in June. This shrub seldom exceeds one foot in height. *Spiraea trilobata* introduced from Asiatic mountains grows about two feet in height. The flowers are tiny, white, appear in May, and cover the twigs. From China comes *Spiraea callosa* with rose-colored flowers. This species, and its variety *alba*, are low shrubs which can be successfully used for borders or low hedges. The var. *alba* flowers for a long period and is therefore very valuable.

All Spiraeas flowering in the Spring should not be pruned excessively. It should be done after flowering so that the strength of the plant is not wasted in seed formation. When pruning only the soft immature wood



Spiraea prunifolia

should be removed. Those Spiraeas flowering later in the season should be strongly pruned after the flowering period. This should not be left for the Winter. Here the tips of the shoots coming from the ground and the tips of the lateral shoots from the old wood should be



Spiraea chamaedryfolia

cut off. All thin and much branched twigs must also be removed.

(Continued on page 551)

Suggestions On Planting Roses

HENRY J. MOORE

THERE are many factors which are essential to success in the culture of Roses, but few which have a greater bearing upon success than proper planting. The planting of Roses is not a difficult operation, any intelligent person may perform it, and if a little study is made of the conditions under which the planting may most favorably be done, success will generally be assured.

The Soil.—The best soil for Roses is a well drained clay loam, and to receive them should properly have been prepared last Fall. If it were not, it should be lightly manured with well rotted cow manure, and be dug as soon as dry enough in Spring. Over-manuring may be disastrous to the Roses. No attempt should be made to plant for some time after the beds are dug, unless at the time the soil is warm and friable. Soils which are too light, such as sandy loams, may be rendered satisfactory by the addition of fifty per cent of heavy clay loam.

Preparing the Roses.—Sometimes Roses are not in a good healthy state when received. If the bark has a shrunken appearance, bury the plants completely in the garden, or in boxes of moist sand or soil for four or five days in a cool place. Plants which after this treatment still appear shrivelled may be worthless. Assuming, however, that the plants are healthy, the next step will be to prepare them for planting in the following way:

Remove all broken roots with a slanting upward cut by means of a keen knife, and shorten any very long ones to an average length, so that the plant has a nicely balanced root system. The aerial growth of the plants may at this time be pruned, or the operation be deferred until the planting is completed.

Digging the Holes.—Dig the holes to receive the Roses with a spade (not with a shovel). Make them wide enough to allow the roots to radiate from the stock without bending, and deep enough to allow the plants to be set therein, so that the point of union of stock and scion (bud graft) may be covered with two inches of soil. Break the soil finely in the bottom of each hole, and plant at once.

Planting.—When about to plant, immerse the roots of all plants which appear dry for a few minutes in water. Next, seek the aid of a person to hold the Roses in position when the roots are placed in the holes; with the hand spread out the roots, practically at the level at which they spring from the stock, allowing them to incline only slightly. With the disengaged hand, fill finely broken soil between and under the roots until they are all covered, after which gently move the plant upward and downward carefully without materially disturbing the position of the roots. This will cause the soil to pack lightly around and between the roots. With the spade, fill the soil level with the normal ground line, then tramp it gently but firmly around the plants without in any way bruising the bark of scion or stock. If the weather is warm, or the soil is dry, water the plants at this stage, soaking the soil thoroughly, and in an hour or so finish the operation by filling in more soil to cover the "bud graft" about two inches. The last two weeks of April and the first week of May in normal seasons is the proper time to plant Roses in the Northern States and Southern Canada. The hybrid perpetuals should be planted two and one-half feet apart, and the hybrid teas one and one-half to two feet apart.

Finishing the Work.—With a steel rake with sharp teeth, rake the surface of the bed, break all clods, remove all debris, such as stones and prunings, and finally edge the beds neatly with the edging knife or spade, using a garden line during the operation, so that the edges will be kept uniform and the beds of the desired shape.

Note.—Generally speaking, the hybrid perpetual Roses do better than the hybrid Teas in localities where the temperature falls twelve degrees or more below zero. Where, however, lower temperatures than this are not experienced, the hybrid Teas are satisfactorily hardy, and in many ways more desirable. Both kinds may as successfully be planted in November as in April, where the temperature does not fall below the forementioned mark, though this is not generally known.

The Camellia

GEORGE F. STEWART

AFTER a lapse of many years, the genus *Camellia* apparently is coming into more general use as a Winter flowering plant. A well grown, nicely shaped plant will always attract attention because of its ample glossy evergreen leaves, but when loaded with flowers, as some of the varieties are, they are truly a gorgeous sight. They have been known to cultivators of plants for many years, and we have had some plants on this place for nearly one hundred years.

Camellias, as a rule, are not difficult to root from cuttings, although they are much slower than many plants in forming their roots. Some of the weaker growing varieties are better if grafted on the strong rooting kinds. After they have completed their young growth, is the best time to take cuttings, which is generally in the month of August. A propagating bed with a brisk bottom heat and cool top will root them most quickly.

Potting should be attended to as soon as the roots are formed. Camellias will grow in either peat or loam.

In the former they will grow more freely but they will flower better when grown in a good turfy loam. Care should be taken that no lime gets into the soil, as I have known a good plant to be ruined by it. Add a good proportion of sand to the soil to insure porosity; also a little charcoal which will keep the compost sweet. The potting material should be broken up by hand, in lumps as large as can be conveniently packed around the ball. Firm potting is the order for Camellias. After they reach a six-inch pot, every two years will be often enough to disturb the roots for re-potting. Plants in larger receptacles may go several years without being shifted.

I find that a little feeding with cow manure water, when they are making their yearly growth, is beneficial. Clay's is the only safe fertilizer to use as a change. I am perfectly aware that a difference of opinion exists about feeding them with stimulants, but in my experience, it is both safe and helpful when the plants are well rooted, until they set their flowering buds.

A temperature of 25 to 50 degrees at night should be maintained during the Winter months with about 10 degrees raise in sunny weather during the day. If a longer season of flowering is desired, part of the plants may be moved to much lower temperature, merely keeping out frost. By so doing, Camellias may be had in flower from October until June. A light shading should be put over the glass early in March to prevent the leaves from being scorched.

When the flowers are used for cutting, one should exercise due care that too much of the wood is not cut away, to procure long stems. It is more advisable to use them with a leaf or two attached, in a floating dish. If the Camellias are cut with long stems, the plants will very soon be ruined. They look best as pot-plants, and if one

is careful in growing them, convenient size plants, covered with flowers, may be had in from eight to ten-inch pots. Plenty of space must be allowed between each plant while growing.

Insects, such as mealy bug, scale, and thrips are liable to attack them, but these may be kept in check by using hydrocyanic acid gas, and a liberal syringing when they are out of flower.

Varieties of Camellias, like a great many other plants, are becoming too numerous to mention. As they seed freely, in mild climates, many new ones are always being raised. With some of the varieties, the flowers are so double that they drop off the plants without ever opening fully. For pot-plants, I prefer singles and semi-double varieties.

April Birds

PAUL B. RIIS

HOW good it seems to be alive, again to enjoy the balmy air of Spring sunshine, to hear the happy warble of the bluebird, the carol of the robin, the frantic call of the killdeer, the honking of the geese and the jubilant outpouring of the song sparrow. But how much better it seems to be alive and able to appreciate Nature's every mood, to visit with her in the fields, meadows and woodlands and meet old friends and acquaintances.

How nicely science has aided us in fixing individuality onto every stone, weed, flower, shrub, tree, butterfly or bird. And how we enjoy the privilege to thrust aside, cold and scientific interest for knowledge less intense, knowledge which finds response in our appreciation. How barren and hopeless this thicket must look to the uninitiated and how quickly we may awaken his interest by bringing to his notice the many wonders of Nature, contained therein, the many friends, rewarding our search with surprises that warm our hearts and quicken our pulses. How indelibly many outings into such places are written into our memories not on account of our companions or the incident of travel but because of the enriched knowledge, the pleasurable introduction to new wonders and the raptures of discovery of more secrets.

The gradual unfolding of bud and leaf radiant with the rosy tints of life, the first bloom of the *Hepatica* coincident with the arrival of the hermit thrush are such indications of the progress of migration. The advancing season hastens the growth of vegetation and with its hosts of insects, offering a field of activity to the insectivorous birds. The robins and bluebirds are closely followed by aquatic birds and birds of prey and again by the various sparrows, then the waders, flycatchers and swallows and a few of the hardier warblers. The increasing varieties of food, increase the varieties of arrivals, each coming in its turn as its peculiar food is forthcoming. The flycatchers and swallows are feasting on winged insects, long before the warblers are able to get a sustenance from the soft bodied insects and scales coincident with the growth of tender shoots. Others, living largely on insects adjust their appetites to a partial seed diet, notably the robin and bluebird. Nesting begins quite early in the month, especially with the two-brooded birds, but the uncertainty of temperature takes heavy toll among the young fledglings. Among eighty-three nests built we noted thirty-five failures or forty-two per cent. Of these twelve per cent were directly traceable to the effects of chilling winds and rains. Quite undaunted the birds usually

plunge into a second and third venture of parenthood. Millet and sunflower seed scattered among the shrub border or under evergreens will attract many a migrant to prolong a pleasant visit. Water in the bird bath now becomes a necessity and the scattering of short strings will prove a great aid to the robin in building. Pans filled with mud in dry seasons are eagerly visited by the same bird, its bulky nest without its cement suffering greatly in heavy downpours. Of the many birds to be expected during the month we append a list from our diary. Dates of arrival may vary two weeks either way, depending on the season, but the observations are a fair representation of the migration during the month:

April 1.—Mourning Dove, Yellow-bellied Sapsucker, Cowbird, Broad-winged Hawk.

April 3.—Purple Martin, Bluebird (building nest), Ruby-crowned Kinglet.

April 4.—Buffle-head Duck, Golden-eyed Duck, White-throated Sparrow, Coot, Robin (building nest).

April 6.—Tree Swallow.

April 8.—Chipping Sparrow.

April 9.—Grasshopper Sparrow, Lark Sparrow.

April 10.—Bronzed Grackle (building nest).

April 11.—Bank Swallow, Swamp Sparrow.

April 12.—Gray-checked Thrush, Bittern, Horned Grebe.

April 15.—Clay-colored Sparrow, Sharp-shinned Hawk.

April 17.—Brown Thrasher.

April 22.—Cliff Swallow, Myrtle Warbler, Prairie Warbler, Water Thrush, Willow Thrush, White-crowned Sparrow, Barn Swallow, Winter Wren (singing).

April 27.—Greater Yellow-legs, Spotted Sandpiper, Baldpate Duck, Red-breasted Merganser.

April 28.—Black Tern, Solitary Sandpiper, King Rail, Canvas-back Duck.

April 29.—Veery.

What though you have found no treasure, nor has any friend left you a rich legacy! Diligence is the mother of good luck, and God gives all things to industry. Then—
Plough deep while sluggards sleep,

And you shall have corn to sell and to keep.

Work while it is called to-day. . . One to-day is worth two to-morrows, as Poor Richard says.—*Franklin*.

The Greenhouse, Month to Month

W. R. FOWKES

APRIL and early May, with longer days and all plant life active, call for greater activity in the greenhouse. Floors require more damping down; ventilation must be watched; and all small items, such as repotting and transplanting of seedlings, must be properly attended to.

The compost heap needs to be turned several times, and when time permits, should be chopped ready for filling the benches.

Young carnation plants should be in a cold frame to gain vigor. They can withstand early outdoor planting, if properly hardened.

Young 'Mums require repotting. The cold frame is an excellent place for them until they are ready for their final pots or beds.

Nearly every one has his mind made up as to what new varieties of roses he desires to grow. After a visit to the New York Show, where large and small places exhibited, and where the best standard varieties of plants were on view, as well as the novelties, most people placed their orders for young roses. It is a waste of time for a person with limited glass to propagate when he can buy splendid stock from first-class houses whose reputations are well established. Order your roses so that they will come when the benches are ready and prepared for planting. It will save a lot of most valuable space and time later on.

The young cyclamen plants should be ordered to arrive in July in three-inch pots. It is not worth the time for a man who grows only a few plants to sow seed and give the coddling these plants require. The specialist grows them by the thousands in special houses, devoted entirely to them, where they have the advantage of companions early in life. Plants are like human beings and enjoy congenial company.

In May, *Amaryllis* should be placed into a frame, and gradually ripened off.

Gloxinias must be fed, and cow or sheep liquid is fine for them. The fleshy leaves are now hiding the pots, and one should be careful not to allow water or dust on the foliage. Dampen around the gloxinias several times daily or their usefulness will be materially shortened.

The pot fruits can be syringed more. Disbud the young shoots, leaving sufficient for next year's wood. Bear in mind that it is better to have too much young growth a peach or nectarine tree than insufficient. As the fruits develop watch with caution, and never close the house except in case of a storm, until after stoning. If you do not know when they have stoned, cut a fruit in two on each tree. If the hard stone is there, it will be safe to give more heat, but until they have passed the stoning period, the night temperature must not exceed fifty degrees. This needs to be constantly emphasized. They are a source of great pleasure and their full beauty will be more than appreciated when you can take the fully developed plants to the dining room.

The peach and nectarines may be a little pale in leaf, due to a deficiency of iron in the soil. If so, give half an ounce of sulphate of iron in a gallon of water once a week for three weeks, which will invigorate them. After

these plants have stoned, the night temperature can be raised, and air should be left on all night.

It is now time to prepare a supply of plants to take the place of those which are to be removed to verandas, porches, etc. *Celosia*, Pride of Castle Gould, is a very fine plant for this purpose and will develop fully four feet in diameter. Sow a pinch of seed, picking off as soon as they are fit to handle, into flats of leafy soil. Keep them warm, and pot into three-inch pots. Never allow them to become pot bound, but have them growing continually. You will be amply rewarded for your efforts when they reach their flowering size.

In the propagating house, which is sometimes a barren spot in Summer, grow a few climbers. *Gloriosa Rothchildiana* makes a very good annual climber. The bulbs or tubers can be procured and started in ten-inch pots in which they are to bloom. The compost should be rich. Drain with two inches of crocks, covering the crocks with two inches of dry cow manure. The rest of the soil should be loam and sand with a little leaf mold. Do not water until growth commences, and then syringe well to drive off the red spider. Trained on a trellis or pillars, this climber will delight you with its unusually attractive flowers.

Lilium speciosum, if potted now, will flower nicely by mid-Summer and be very charming in the conservatory when the bulbs are out of season. The variety *Kraetzerei* is especially adaptable for this time. *Album* is another fine variety and the seedmen's catalogs list annually varieties worth growing.

The orchids require top air during the night. One should be careful not to wet them too much with the extra spraying now necessary. The pots and paths should also be dampened more, but at the same time, every orchid house should have a short period of dryness to keep the young roots active. To do this properly, one should have all under his own control, and there should not be constant dripping. The old-fashioned idea of troughs on the pipes is out of date for orchids. Moisture should be applied with study and for a reason. The excessive dampness arising from the evaporating troughs or pans causes soft growth that will not give a fair yield of bloom. To grow and flower successfully, it is unnecessary to have the plants green.

Pinch off a few buds from each rose bush in order to have a steady supply. If a heavy crop for Decoration Day is desired, one must sacrifice April's first buds. Feed well with liquid manure twice a week, watch that the plants are never dry at the roots. Syringe more heavily every fine morning than during the past few months.

Sow the earliest batch of primulas, *malacoides* and *obconica*. They come up irregularly, and to the amateur this is a source of worry. Do not throw a pan of seed away for two months. Use light, sandy, finely sifted soil with half leaf mold and some sifted sphagnum moss, and water the whole two hours before sowing the seed in a seed pan. Sift a minute portion on top and gently press the soil down. Cover with a pane of glass and shade with paper. Place in a temperature of about 65 degrees at night. Do not try forcing, for in so doing, one may lose them all.

Work for the Month in the Garden

SAMUEL GOLDING

THE real busy season is now with us, and no opportunity should be neglected to push ahead, and endeavor to keep abreast of the stress of work that will demand immediate attention in the vegetable and flower gardens.

Peas are a most important crop, and care should be taken to secure perfect successions, sowing at intervals of about every two weeks. The quantity sown must, of course, be gauged by the demands of each establishment. When these early peas are above the ground, it is advisable and good practice to stake or brush them, as this is a protection from the cold, keen winds which we are likely to experience during the early Spring months.

Plant out onion sets sown earlier in the greenhouse or frames. See that they are properly hardened off to withstand the effects of the move. Onions revel in a deep, rich soil and the ground should be deeply dug or trenched in the Fall if possible, incorporating plenty of good farmyard manure.

Before planting or seeding, the soil should be in a good workable condition, so that, if it is easily worked, there will be no sign of stickiness. When planting, get the roots as far down as possible. By that, I do not infer to bury the plants, but to set them in the same depth as they were in the flats, and make firm. It is a very common fault that not enough attention is paid to having the soil firm before planting or sowing, which applies to any operation in the garden, whether planting vegetables, flowers or trees.

The seedlings from the earlier sowings will be growing apace. Transplant them early, and grow along as cool as possible in order to have sturdy plants.

Early leeks from the first sowing can be planted out as soon as conditions permit. They are gross feeders, and respond to generous treatment. There are several methods adopted for growing large leeks, but the one which is most generally followed, is to plant in prepared trenches, and gradually bank up the soil around them during the growing season, to secure fine blanched stems. They are a valuable Winter vegetable, and deserve to be more grown and appreciated.

Vegetables growing in pits or frames will need an abundance of water and careful attention regarding ventilation.

Protect the hearts of cauliflowers from direct sunshine by breaking some leaves over the plants.

Make one more sowing of string beans inside, and near the end of the month make a sowing outside on a warm border.

Transplant and keep growing, egg plants, peppers, tomatoes. Make a sowing of sweet corn in pots, and also lima beans, squash, cucumbers for early planting when the soil is warm. Globe artichokes should be kept growing until placed into final quarters.

Lose no time in planting early potatoes and main crops before the month is out, and endeavor, if possible, to change the ground each season for this crop. A change of seed is an important and essential factor in securing good crops during successive seasons.

Now is the time to plant new asparagus beds. Secure good two-year-old plants, placing these out in well prepared trenches about eight inches deep, about two feet

apart, and three to four feet between the rows. If this space can be spared, cover the crowns with two inches of soil, and the trench can be gradually filled until level. Small crops can be grown during the first year or two.

Any alterations that are contemplated in the herbaceous border must be done at the earliest opportunity. Clumps of perennials that have become too large should be divided. This of course alludes to such subjects as *Heleniums*, hardy asters, and other Fall blooming subjects. *Peonies*, *iris*, oriental poppies and other Spring flowering plants must be divided and replanted in September.

Plants of *Digitalis*, Sweet Williams, pansies, Canterbury Bells, daisies, etc., that have wintered in the cold frame must be planted out.

Annuals that do not take kindly to being transplanted should be sown where they are to bloom, thinning out the plants when large enough to allow proper development to those that remain.

Mignonette, poppy, *Eschscholtzia*, *Alyssum*, *Dimorphotheca*, and the like are impatient for removal.

Sow late branching asters outside around the end of the month; also verbenas, marigolds, *Phlox Drummondii* and other annuals for late cutting.

Prune outdoor roses. Hybrid perpetuals require a more severe cutting back than the Teas and hybrid Teas. Remove weak and useless wood and shorten back to a good eye. Give a good dressing of cow manure and avoid damage to the roots when digging it in.

The making and seeding of a new lawn should be proceeded with as soon as possible. The ground should be well prepared with good manure plowed in, making it firm before seeding. After sowing, rake it in and go over it again with the roller. When all frost is out of the ground run a heavy roller over the lawns. Where the grass is thin, rake in more seed with a dressing of fine soil or humus.

Push on with the planting of deciduous trees, shrubs, fruit trees, evergreens, etc. Cut well back the deciduous trees to maintain the balance between the roots and tops, and if dry, give a thorough watering. This should be repeated if the weather continues dry. Care must be taken that they do not suffer from drought until quite established and root action has become active.

One of the most popular and satisfactory plants for covering bare and unsightly places under trees is the Japanese Spurge, *Pachysandra terminalis*, a very attractive evergreen which should be planted now.

Edge the drives and garden paths as this adds much to the general appearance of any place. A dressing of stone should be applied to drives where needed.

After experiencing one of the most open Winters on record, we anticipated an early Spring, for March was doing its best to emulate April and behaving quite like the proverbial lamb. On the morning of the 28th, the mercury was flirting with eighty degrees in the shade. On every hand could be seen plain evidence that Spring had arrived. Early tulips and flowering shrubs were showing their buds, and the magnolias in many instances were in full bloom with a wealth of wonderful blossoms. The Forsythias were looking like cascades of golden bloom;

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Water Conservation in Plants

WILLARD N. CLUTE

ONE of the first requirements of plants is an adequate supply of moisture. Many species grow immersed in water and the roots of land plants ramify through the soil in all directions in search of this precious fluid. In all growing plants, there is a constant stream of moisture flowing in through the roots and out through the stem and leaves. One seldom realizes the amount of water that passes through a plant in this way. The alfalfa plant uses more than a thousand pounds in producing a pound of dry matter and other crops require quantities almost as great.

It is plain that only a small part of the water that flows into the plant is used in making food. The rest escapes into the air as water-vapor but it is not wasted, for by evaporating it keeps the plant cool. Recent experiments have shown that a leaf in full sunshine may receive enough heat in one minute to raise its temperature thirty degrees. At this rate a fatal temperature would soon be reached were it not for evaporation. Just how effective this process is may be realized from the fact that it requires more than five hundred times as much heat to evaporate a given quantity of water as it does to raise its temperature one degree.

Notwithstanding the constant supply of moisture from the soil, plants are often in considerable danger of drying up. This is especially true of specimens exposed to periods of actual drouth, or to the physiological drouth of Winter when the water in the soil is not available because frozen. When such periods occur the plant usually reduces sail by dropping its leaves. Many desert plants have become practically leafless in response to extended seasons of this kind, their work of food-making being now carried on by the green tissue of the stems. When the drouth is only temporary, as in the hottest part of the Summer day, the leaves may assume different positions to avoid the strong sunlight and consequent loss of water. Corn leaves roll up, the leaves of compass plants and wild lettuce turn their edges to the sun and the leaves of many of the *Leguminosae* droop. In cold seasons, a similar rolling of leaves is noticed in most of the plants hardy enough to retain these structures.

The leaves are peculiarly situated as regards moisture. On the one hand they must evaporate enough to keep cool and on the other they must retain enough to enable them to carry on their activities. They are therefore provided with an epidermis that prevents the passage of moisture, but which is provided with great numbers of tiny openings called stomata, through which moisture may escape. The cells which surround these openings can contract or expand them as occasion requires and thus the loss of water is in a measure controlled.

Young stems are also covered by an epidermis in which there are openings known as lenticels. The tiny specks seen in the young bark of elder, cherry, alanthus and other woody plants are lenticels. In the white birch the increasing girth of the stem stretches the lenticels horizontally, forming the familiar dark streaks in the bark. The streaks in a piece of cork are produced by the same structures. Stomata are usually too small to be seen with the unaided eye, but they are visible in the leaves of the common white or Madonna lily and with a simple lens they may be seen in the leaves of many other plants.

When leaves are exposed to much sunlight as in the tropics, the epidermis often secretes a layer of cuticle consisting of a waxy substance called cutin. Sometimes the cutin is in rods, grains or flakes which give the leaves a

gray or whitish color, as in the cabbage and carnation. This layer, called bloom, is characteristic of such fruits as the grape, plum, and nectarine. A similar deposit on the apple makes the fruit shine when rubbed, a fact which has been commercialized by the owners of fruit stands. Sometimes the leaf has what is known as a multiple epidermis in which additional cells filled with water aid in absorbing the sun's heat. A very good illustration of this may be seen in a cross section of the leaf of the common rubber plant.

Hairs and scales of various kinds aid the epidermis in protecting the leaves. Some are simple, others branched and still others have glands at their tips in which is an oil reputed to still further conserve the moisture. The leaves of *Deutzia*, mullein, primrose, hollyhock, buffalo-berry and *Geranium* afford fine examples of hairs and scales. These are beautiful objects for microscopic study.

In the woody parts of perennial plants, the epidermis is sooner or later replaced by a more serviceable tissue of cork cells which are closely joined together like epidermal cells but which are unlike them in containing air instead of living matter. To this fact the lightness of cork is largely due. Cork not only protects the stems from evaporation but, since heat crosses stationary air very slowly, it protects the plant from the sudden changes of temperature which are far more harmful than steady cold is. The tissue that forms the cork originates in the epidermis, or in the layer of cells just below it, which is known as cork cambium. Since the formation of a layer of cork shuts off the water from the epidermis, the latter soon dies and falls away. Often the cork cambium is thrown off in turn by another layer that forms deeper in the tissues of the bark.

The old corky bark may remain on the stem for a number of years, but ultimately it is shed, being cracked and loosened by the expanding tissues within. Owing to the way in which the cambium is arranged, the bark breaks up into patterns that are characteristic and distinct enough to serve for identifying the different species. One calls to mind in this connection, the rough bark of old cottonwoods, the fine netted bark of walnut and ash, the winged bark of hackberry and the splintery bark of hickory. In the buttonwood or sycamore the bark falls off in flakes, in the birch it forms papery layers, and in the grape-vine it forms long strips. Sometimes the cork cambium does not develop evenly and thus gives rise to corky ridges and wings that are often very conspicuous as in the sweet gum, the *Euonymus* and some oaks and elms. The cork from which the stoppers of bottles are made is the greatly developed tissue of a species of oak. In young twigs cork cells may be of various colors and thus give the characteristic colors to many species. The red of dogwood, the yellow, orange and purple of willows, the green of wahoo, the olive of golden bell and the sober grays of beech and butternut are illustrations of this.

In addition to its other functions, cork protects the tissues of the stem from mechanical injury and assists in healing wounds that may occur. When a branch is cut off a layer of cork soon spreads over the wound under cover of which the tissues within may complete the repairs. Cork tissue also covers the scars left by the fall of the leaves. In exposed situations the bark of trees is thickest on the side most exposed to the cold and wind. On the other hand, the trees in tropical regions where the air is

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Uses of Native Ferns in Cultivation

HERBERT DURAND

NATIVE FERNS are swiftly coming into favor and every planting season finds more and more of them brought under cultivation. The professional gardener, as well as the amateur, is beginning to realize their usefulness. Their characteristics are so varied and the conditions under which they will grow are so broad, that varieties may be chosen to serve almost any purpose.

Ferns as a rule are easily grown, although there are some varieties which require special care. Ordinary garden soil will do very well for some of the ranker growing kinds. The varieties of smaller growth, which comprise those classed as rock ferns, require very rich soil. In the wild, the soil in which they flourish is almost pure leaf mold. There are a few which are found growing on limestone ledges. These in cultivation require in most instances the addition of a small amount of lime to the soil.

Most ferns grow naturally on sloping ground, and this, of course, insures excellent drainage. If we are to imitate Nature, we must supply similar locations. Some kinds, which are found in lowland situations, such as *Aspidium thelypteris*, *Onoclea sensibilis* and all the *Osmundas*, do not absolutely require well drained locations, but will grow in soil that is so drained.

It does not necessarily follow that ferns must be planted in a location exactly like that where they are found growing wild, or that they will not thrive in places where the conditions are different. This has been definitely determined by exhaustive experiments.

The best season of the year for planting ferns seems to be any time except during the Winter months and possibly during July and August. It has been found that ferns can be transplanted even in mid-Summer, by cutting off the fronds. New fronds soon appear. They will not, however, be as strong as the original would have been. This treatment does not seem to be injurious to the roots, as they throw off as vigorous a growth as ever the following Spring. If ferns are planted in early Autumn, the roots have opportunity to become well established before freezing weather and they are ready to start new growth as soon as the frost leaves the ground in the Spring.

One of the most difficult problems which confront nearly every amateur is to find attractive plants that will thrive and cover the ground in dry, shady locations, as under trees. There are very few flowering plants which can be introduced under such conditions with satisfactory results. There are some varieties of ferns, however, which can be planted in such places and will prove entirely satisfactory. Perhaps the four best varieties for this purpose are *Polystichum acrosticoides* (Christmas Fern), *Aspidium marginale* (Evergreen Wood Fern), *Dicksonia punctilobula* (Hay-scented Fern) and *Osmunda Claytoniana*. *Osmunda Claytoniana* grows to a height of from two to three feet and should be planted in the background. *Dicksonia punctilobula* and *Aspidium marginale* grow about 18 inches high and *Polystichum acrosticoides* from 12 to 15 inches. These four varieties make a fine group. *Aspidium marginale* and *Polystichum acrosticoides* are evergreen and retain their fronds during the entire year.

When ferns are planted in a dry location, special care should be taken in preparing the soil. It should be made fine by spading and a liberal amount of natural humus should be added. This not only supplies fertility, but it makes the ground more porous and holds the moisture

better. Frequent watering is essential until the ferns have sent out new root growth.

It is well, especially when ferns are planted during the Fall months, to give them a mulch of leaves. This helps to retain the moisture in the soil and also affords protection against upheaval by frost. Care, however, should be used not to have the mulch too heavy on newly planted stock, as by so doing, the plants are apt to be smothered. Many amateurs are unsuccessful in growing native ferns, because they plant them too deeply. Such ferns as the Christmas Fern, Evergreen Wood Fern, etc., which grow from a crown, should be set so the crown will not be below the surface of the ground, or it is liable to rot during wet weather.

While ferns have no flowers and do not give any color effect except the varying shades of green of the fronds, they are indispensable in every natural or wild garden. Beautiful masses can be produced by the use of the different types and, by proper selections, certain desirable textures and effects may be introduced into the planting.

In nearly every locality, some kinds of ferns are quite common and as they are usually easy to transplant, there is no reason why every fern lover should not grow and enjoy them.

WORK FOR THE MONTH IN THE GARDEN

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the bees were bringing home loads of pollen taken from crocus, willows and maples, when biting Boreas fell upon us chasing the mercury to far below freezing point, and taking the joy of life from the more precocious flowers and shrubs in the garden in a most ruthless manner.

This should remind us that it is still good advice not to begin our early gardening operations too hastily, and that we take great chances in planting out of the greenhouse and frames before the right season is here. The very early warm days often deceive.

WATER CONSERVATION IN PLANTS

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always moist and warm often have so little corky bark that the green of the middle bark shows through and flowers are frequently produced from the trunk as well as from the twigs. The chocolate tree bears most of its fruits on the trunk and larger branches from flowers produced in this way. Among the trees of our own region with this habit is the red-bud or Judas tree, which always produces its pink flowers on the old wood.

SPIRÆAS, THEIR PROPAGATION AND CULTIVATION

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A moist soil where the ground is always wet is not adapted for the cultivation of *Spiræa*. A fertile, not too damp soil having good drainage is best suited for these plants.

Propagation of the Spring flowering species and varieties is usually carried out by means of cuttings taken from the green wood. These are then placed in the sand under glass where they remain until they have formed a good root system. The late flowering *Spiræas* are propagated through cuttings made from mature twigs. These are taken in the Fall or the Winter, placed in sand-filled boxes, and kept cool. Finally they are planted in the Spring in the usual way.

INTERNATIONAL FLOWER SHOW

THE eighth annual International Flower Show, held in the Grand Central Palace, New York, last month, far surpassed any flower show ever before staged in this country in beauty and arrangement, and seldom have finer qualities of plants and flowers been brought together in such quantities as were displayed at this Show. From a financial standpoint, it was a grand success, and the committee in charge of the management is to be congratulated. Great credit is due Arthur Herrington, who was in charge of the general arrangement, which could not have been improved on as far as the exhibits go. It is hoped, however, that at future shows more consideration will be given to the uniformity and regulations of the trade exhibits that will keep them more in harmony with the show itself.

The layout of this year's Show was entirely different and vastly superior to former efforts at the Grand Central Palace, the four gardens, each of a thousand square feet, contributed the chief feature. Each one was so distinctive in itself that keen interest was created in them among the garden lovers. John Scheepers, Inc., with a bulb garden (illustrated on our cover), won first prize and the Sweepstake prize; F. R. Pierson with a general garden layout, second prize. Bobbink and Atkins and Julius Roehrs Company were the other contestants in this class.

Among the private growers the five-hundred foot groups of Adolph Lewisohn (John Canning, superintendent), and Mrs. Payne Whitney (George Ferguson, gardener), located just at the head of the stairs as one entered the hall, were superb with their flowering plants of great variety and many colors, arranged in perfect harmony. The Lewisohn group, illustrated on another page, was awarded first prize, also the Gold Medals of the National Association of Gardeners, the Garden Club of America, and the International Garden Club, for the most meritorious private exhibit. The Whitney group was awarded second prize. William B. Thompson (Andrew Strachan, gardener), had an attractive group of semi-tropical plants.

Mrs. F. A. Constable (James Stuart, gardener), exhibited a wonderful collection of acacia plants in excellent flowering form. With it were a group of fine flowering *Imantophyllum* (clivias) which together made an attractive exhibit.

W. R. Coe (A. E. Thatcher, gardener), had an exhibit of camellias and acacias in tubs, as well as other flowering plants.

There were several other interesting groups by private growers, a fine collection of orchids by James B. Duke, and many classes of specimen plants, bulbs and cut flowers, liberally supported by professional gardeners. The table decorations each day of the Show were an added attraction around which the general public gathered.

The amateurs took an active part this year, and no doubt their interest will increase with future shows. The Bird Baths with their planting, arranged by various garden clubs, were carefully studied by professionals, and were a welcome addition to the many classes.

The rose exhibits alone were well worth a visit to the Show, some of the finest roses ever seen being on exhibition. The Burpee exhibit of sweet peas was one of great beauty in its wealth of varied shades, and deserves special mention.

The other commercial exhibits were all of high quality. The wild garden by Edward Gillet was a new introduction. The orchid exhibits are also worthy

of special mention, Joseph Manda Company, Julius Roehrs Company, Lager and Hurrell, all being represented. The Bobbink & Atkins rockgarden was a pleasing feature.

The trade exhibits were numerous, but there is opportunity for more orderly arrangement in this department of the flower show, and an improvement might fittingly be introduced at the National Flower Show to be held in Cleveland next year.

Space does not permit publishing the awards to commercial growers. The awards to private growers as given in the official list follows:

OFFICIAL LIST OF AWARDS

Private Growers

- Acacia, 3 plants, one or more varieties.—1, Mrs. F. A. Constable, Mamaroneck, N. Y.
 Acacia, specimen, any variety.—1, Mrs. F. E. Lewis (J. W. Smith, Supt.), Ridgefield, Conn.; 2, Mrs. F. A. Constable, Mamaroneck, N. Y.
 Amaryllis, 12 plants.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Mrs. F. A. Constable, Mamaroneck, N. Y.; 3, Miss A. DeLamar, Glen Cove, N. Y.
 Amaryllis, 6 plants.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Mrs. F. A. Constable, Mamaroneck, N. Y.
 Azalea, specimen, any color, not less than 3 ft. in diameter.—1, James A. MacDonald (R. Hughes, gdr.), Flushing, L. I.; 2, Wm. B. Thompson (Andrew Strachan, gdr.), Yonkers, N. Y.
 Azalea, 3 plants, any color.—1, James A. MacDonald.
 Cineraria, hybrid, 6 plants.—1, Mrs. Wm. D. Guthrie (Jos. A. Winsock, gdr.), Locust Valley, N. Y.; 2, Wm. B. Thompson, Yonkers, N. Y.
 Cineraria stellata, 6 plants.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Adolph Lewisohn (John Canning, Supt.), Ardsley, N. Y.
 Cineraria stellata, specimen, any type.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Mrs. Wm. D. Guthrie, Locust Valley, N. Y.; 3, Adolph Lewisohn, Ardsley, N. Y.
 Cyclamen, 25 plants, arranged for effect, decorative plants permitted.—1, Mrs. F. A. Constable, Mamaroneck, N. Y.; 2, Adolph Lewisohn, Ardsley, N. Y.
 Cyclamen, 6 plants. 1, Mrs. F. A. Constable, Mamaroneck, N. Y.; 2, Mrs. Payne Whitney (George Ferguson, gdr.), Manhasset, L. I.
 Chorizema, specimen.—1, Mrs. F. E. Lewis.
 Cytisus, specimen, any variety.—1, Adolph Lewisohn, Ardsley, N. Y.
 Erica, specimen, any variety.—1, Mrs. F. E. Lewis; 2, Peter Hauck, Jr. (Max Schneider, gdr.), East Orange, N. J.
 Fuchsia, 1 standard specimen.—1, Mrs. Payne Whitney, Manhasset, L. I.
 Geranium, 1 standard specimen.—1, Mrs. F. E. Lewis.
 Heliotrope, 3 standard specimens.—1, Adolph Lewisohn, Ardsley, N. Y.
 Heliotrope, 1 standard, specimen.—1, Mrs. Payne Whitney, Manhasset, L. I.; 2, Adolph Lewisohn, Ardsley, N. Y.
 Hydrangeas, 3 plants, not less than 8-in. pots.—1, Adolph Lewisohn, Ardsley, N. Y.
 Hydrangea, specimen, not less than 8-in. pot.—1, Adolph Lewisohn, Ardsley, N. Y.
 Imantophyllum, specimen.—1, Mrs. F. A. Constable, Mamaroneck, N. Y.; 2, Mrs. George D. Pratt (J. F. Johnson, gdr.), Glen Cove, N. Y.
 Lilac, 6 plants.—1, Adolph Lewisohn, Ardsley, N. Y.
 Marguerite, specimen.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Mrs. Payne Whitney, Manhasset, L. I.
 Primula malacoides, 12 plants.—1, Mrs. Wm. D. Guthrie, Locust Valley, L. I.; 2, Adolph Lewisohn, Ardsley, N. Y.
 Primula obconica, 12 plants.—1, Mrs. Payne Whitney, Manhasset, L. I.; 2, Ralph Pulitzer (Herbert Collins, gdr.), Manhasset, L. I.
 Primulas, 6 plants in variety.—1, Mrs. Wm. D. Guthrie, Locust Valley, L. I.; 2, Ralph Pulitzer, Manhasset, L. I.
 Schizanthus, 3 plants.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Adolph Lewisohn, Ardsley, N. Y.
 Schizanthus, specimen.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Wm. B. Thompson, Yonkers, N. Y.
 Spiræa or Astilbe, 6 plants.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Wm. B. Thompson, Yonkers, N. Y.
 Wistaria, specimen.—1, Adolph Lewisohn, Ardsley, N. Y.
 Any other specimen flowering plant.—1, Miss A. DeLamar, Glen Cove, L. I.; 2, Mrs. F. H. Allen (James Linane, gdr.), Pelham Manor, N. Y.
 Flowering plants, covering 500 sq. ft., arranged for effect (Orchids excluded), suitable accessories permitted.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Palms and Foliage Plants

- Areca lutescens, specimen.—1, Mrs. F. A. Constable, Mamaroneck, N. Y.; 2, Wm. B. Thompson, Yonkers, N. Y.
 Bay Trees, 2 plants, specimens.—1, Wm. B. Thompson, Yonkers, N. Y.
 Dracæna, 3 plants.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Sterling Postley (James H. Andrews, gdr.), Oyster Bay, N. Y.
 Kentia Forsteriana, specimen, single or bushy.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Adolph Lewisohn, Ardsley, N. Y.
 Kentia Belmoreana, specimen, single or bushy.—1, Mrs. F. A. Constable, Mamaroneck, N. Y.; 2, Wm. B. Thompson, Yonkers, N. Y.
 Phoenix Roebelenii, specimen.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Sterling Postley, Oyster Bay, L. I.
 Palm, other than above, specimen, single or bushy.—1, Mrs. H. O. Haave-meyer (W. Morrow, gdr.), Stamford, Conn.; 2, Mrs. F. A. Constable, Mamaroneck, N. Y.
 Any specimen foliage plant, not less than 10-in. pot or tub.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Daniel Guggenheim, Port Washington, L. I.
 Group of foliage plants, with orchids permitted, collection covering 200 sq. ft., arranged for effect.—1, Wm. B. Thompson, Yonkers, N. Y.; 2, Adolph Lewisohn, Ardsley, N. Y.

Ferns

- Asparagus, specimen, any variety.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, James A. MacDonald, Flushing, L. I.
 Adiantum Farleyense, or Farleyense type specimen.—1, Mrs. H. McK. Twombly (R. L. Tyson, gdr.), Convent Station, N. J.; 2, James B. Duke (Arthur T. Niles, gdr.), Somerville, N. J.
 Adiantum, any other variety, specimen.—1, Adolph Lewisohn, Ardsley, N. Y.; 2, Mrs. Wm. D. Guthrie, Locust Valley, N. Y.
 Cibotium Schiedei, specimen.—1, Mrs. Geo. D. Pratt (John F. Johnson,

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A Lesson on the Plant In Relation To Water

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE

Under the Direction of ARTHUR SMITH

AMONG the many factors which must exist in a plant's environment, if it is to make proper growth, it is not easy to define one as being more important than another, inasmuch as the non-existence of any one of them may to a greater or lesser extent nullify the effect of the remainder; at the same time, water must be considered as standing first.

As in connection with all other good things, too much water is as bad, or in many cases worse, than too little. Leaving out of consideration aquatic and semi-aquatic plants, excessive water in the soil destroys the roots of plants. We have previously seen that oxygen is absolutely necessary to the life of roots, as since the cells of newly-formed roots are filled with protoplasm, they must have access to the oxygen of the air or they can neither live nor grow. When the soil cavities are filled with water, the roots are soon deprived of oxygen, because the little oxygen contained in the water is soon exhausted. A soil in this condition is known as waterlogged, and smothering and decay of the roots soon follow. Seeds planted under such conditions usually fail. The soil water which is most useful to land plants is that which remains attached to the soil particles after percolation has nearly ceased, known as capillary water. Such water is well aerated because it is interspersed with cavities which are filled with moist air, such cavities being, if the soil is properly tilled, in communication with the air above the soil. The root hairs apply themselves intimately to the wet surfaces of the soil particles, or reach out into cavities filled with saturated air, and are thus able to draw in the well-aerated soil water, with its dissolved food constituents, in sufficient quantity to restore loss from transpiration through the leaves and to distend the newly formed cells.

In the open ground the first remedy for excessive soil water may usually be found in underground drainage. This should be followed by deep and thorough digging which very materially helps the free passage of water through the soil. Digging is a very simple operation to most minds, yet there are few gardening operations which as a rule are worse carried out. It is rarely done deep enough and nothing less than the depth of the fork or spade should be permitted. The drainage of ground with a hard, compact subsoil is greatly facilitated by throwing the top soil well forward when digging and then breaking up the subsoil without bringing any of the latter to the surface. Upon land always plowed at the same depth, whatever this depth may be, the horse's feet and the weight of the plow create in many soils a hard-pan impervious more or less to water, the remedy for which is double plowing. Deep digging and plowing, together with breaking up the subsoil while of considerable assistance in preventing the existence of a water-logged top-soil, do not in the case of the more clayey soils do away with the necessity for pipe draining, the latter if properly carried out will last for more than one life-time.

The trouble of excessive soil water in the open ground often occurs in potted plants, as the result of too compact soil or too copious watering. The expert recognizes this condition by the sour odor of the soil, by lifting the pot, or by tapping the pot with his knuckle. If the soil is soggy, the weight will betray the fact, or the sound given out by the pot will be that of a compact mass instead of a more or less hollow body, as is the case of a pot of well aerated soil. To remedy the evil, repot the plant in fresh soil of a proper condition, providing abundant drainage at the bottom of the pot.

Injudicious watering is perhaps the most common cause of failure in growing potted plants. Some people too often assume that the chief need of plants is frequent watering, and so give water in spoonful doses as the surface soil of the pot appears dry, without observing the state of the soil beneath. The roots of the plant in the meantime may be smothering in a water-logged soil or starving from drought. If, owing to inexperience, the condition of the soil cannot be determined by the means above mentioned, the soil may be tipped out upon the hand without disturbing the roots of the plant, by reversing the pot and gently striking its rim on the edge of the bench or table. The real condition can then be readily determined.

In all connections copious watering at considerable intervals are preferable to frequent slight waterings. It should never be forgotten, what we have mentioned several times before, that air is as essential as water to the well-being of roots, and that the soil, however porous, requires occasional ventilation. A consider-

able quantity of water poured upon the surface soil of a potted plant, in passing downward not only thoroughly moistens the soil particles, but acts like a piston, forcing the vitiated air of the soil cavity ahead of it and out through the drainage hole at the bottom of the pot, while fresh air enters from above as the surplus water passes out beneath.

Rapidly-growing plants require more water and are less liable to suffer from over-watering than slower-growing ones. During the rest period plants should be given very little water.

Some species require more water than others. The native habitat of the plant is a partial guide to the amount of water needed. Plants native to arid regions, as the *Cacti* and those from treeless, rocky locations, require little water and are readily destroyed by over-watering. Plants with narrow and tough leaves, especially when the leaf-blade is vertically placed, do not, as a rule, like much water; plants with broad, leathery leaves prefer a damp atmosphere rather than great moisture at the roots. Succulent plants with hard epidermal cells, and thin-leaved plants with a strong wooly covering of hairs, are also examples of plants requiring little water.

Excessive watering sometimes produces a dropsical condition in the leaves of plants under glass. This is most likely to occur in Winter, when sunlight is deficient, especially if the soil is kept nearly or quite as warm as the air. Water accumulates in the cells, abnormally distending their walls, sometimes even to bursting. An unnatural curling of the leaves, with yellow spots and small wart-like excrescences on their surfaces, are some of the symptoms of this trouble. Less water, increased light and reduced bottom heat furnish the remedy.

Excessive moisture in the air and soil is injurious to plants, since the former tends to hinder normal transpiration, and, combined, they favor the growth of many diseases.

On the other hand, insufficient moisture in the air causes excessive transpiration, which reduces the tension of the cell-walls and thus retards growth. It also tends to clog the leaves with useless matters, causing their premature death. The effects of insufficient moisture in the air are often very noticeable upon plants kept in living rooms. Such plants, especially when few in number, rarely make satisfactory growth and the lower leaves continually perish. Moistening the air by evaporating water in the room, or setting the plants in a zinc tray covered with moist sand usually remedies the trouble.

Insufficient moisture in the open air rarely occurs unless there is also a condition of extreme dryness in the soil.

Insufficient moisture in the soil retards growth both by reducing the tension of the cell-walls and by lessening the supply of food from the soil. Therefore the tendency of drought is to starve the plant.

Drought hastens maturity, especially in annual plants, since it favors flowering. Lettuce, spinach, and the like "run to seed" earlier if insufficiently supplied with water. The crispness and tenderness that give quality to salad plants, such as celery, lettuce, radish, etc., due to the distended condition of their cells, is largely wanting when the water supply during growth has been insufficient.

In periods of prolonged drought artificial watering of plants growing in the open ground may become necessary, but this should only be used as a last resort, when other means of mitigating the effects of dry weather have been used and found to be insufficient.

Plants growing upon a well-drained and deeply cultivated soil rarely suffer from drought, as this condition tends to cause the roots to penetrate deeply and the cultivation prevents the evaporation of soil moisture from the surface. To the latter end the soil between growing plants should be continuously hoed throughout the season, which not only keeps down weeds which rob the plants of water, but creates what is known as a soil-mulch which acts in the same way as a mulching of any material that is a slow conductor of heat and moisture, such as straw, marsh hay, or manure, which are frequently spread between plants to prevent the effects of drought. The maintenance of a soil mulch is the fundamental principle of the dry-farming of the semi-arid districts of the West, where on account of the small average annual rain fall crops are grown on the same ground only in alternate years. The year of no crop is devoted to keeping the soil thoroughly cultivated throughout the season by which means the

greater part of the rain is conserved and carried over to the following year. Surface cultivation should be from two to three inches deep, and the finer the condition in which the surface soil is left the better, and this method is an effectual means of conserving soil moisture and of carrying over the moisture from a period of comparatively heavy rainfall to one when the rainfall is less, or none at all.

Artificial watering if done at all should be thorough, so that the water reaches the roots of the plants. Mere surface watering does more harm than good. Superficial watering encourages the formation of roots near the surface which are more or less killed by subsequent hot sun. Under proper soil conditions—excepting during actual rainfall—the surface of the soil is invariably dryer than the underneath portion, and the roots will keep to the moister portion, but if we continually adopt mere surface sprinkling, then the roots will grow towards the surface, which will be dried out in an hour's hot sun.

OFFICIAL LIST OF AWARDS

(Continued from page 552)

gdr.), Glen Cove, N. Y.; 2, Daniel Guggenheim, Port Washington, L. I.
Stag's Horn Fern, specimen.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Mrs. F. E. Lewis.

Fern, any other variety, not otherwise specified.—1, Mrs. H. O. Havemeyer (Wm. Morrow, gdr.), Stamford, Conn.; 2, Adolph Lewisohn, Ardsley, N. Y.

Bulbous Plants

Freeias, 12 pots or pans.—1, Mrs. Harold I. Pratt (F. O. Johnson, gdr.), Glen Cove, L. I.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Hyacinths, white, three 10-in. pots or pans.—1, Mrs. Payne Whitney, Manhasset, L. I.; 2, James A. Macdonald, Flushing, N. Y.

Hyacinths, pink or red, three 10-in. pots or pans.—1, James A. Macdonald, Flushing, N. Y.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Hyacinths, light blue, three 10-in. pots or pans.—1, Mrs. Percy Chubb (Peter Smith, gdr.), Glen Cove, N. Y.; 2, B. H. Borden (Wm. Turner, supt.), Rumson, N. J.

Hyacinths, dark blue or purple, three 10-in. pot or pans.—1, Mrs. Harold I. Pratt, Glen Cove, L. I.; 2, James A. Macdonald, Flushing, N. Y.

Hyacinths, yellow, three 10-in. pots or pans.—1, James A. Macdonald, Flushing, N. Y.; 2, B. H. Borden, Rumson, N. J.

Lilies, 12 pots, any varieties.—1, Mrs. G. S. Dearborn (James R. Tough, supt.), Rye, N. Y.; 2, Mrs. Harold I. Pratt, Glen Cove, L. I.

Lily of the Valley, three 10-in. pots or pans.—1, Mrs. Payne Whitney, Manhasset, L. I.

Narcissus, six varieties, six 10-in. pots or pans.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Tulips, single early, six distinct varieties, six 10-in. pots or pans.—1, Mrs. Payne Whitney, Manhasset, L. I.; 2, B. H. Borden, Rumson, N. J.

Tulips, double, in variety, six 10-in. pots or pans.—1, Mrs. Payne Whitney, Manhasset, L. I.

Tulips, May-flowering, distinct varieties, 12 10-in. pots or pans.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Special Prizes

Tulips, Darwin, Prince of the Netherlands, 10-in. pot or pan.—1, James A. Macdonald, Flushing, N. Y.; 2, Mrs. Harold I. Pratt, Glen Cove, L. I.

Tulips, Breder, Cardinal Manning, 10-in. pot or pan.—1, James A. Macdonald, Flushing, N. Y.

Hyacinth, distinct varieties in 8-in. pots or pans, 1 flowering spike to the bulb.—1, James A. Macdonald, Flushing, N. Y.; 2, Mrs. Harold I. Pratt, Glen Cove, L. I.

Orchid Plants

Twelve plants in variety.—1, A. N. Cooley (Oliver Lyons, gdr.), Pittsfield, Mass.

Six plants in variety, decorative plants permitted.—1, A. N. Cooley, Pittsfield, Mass.

Orchids in variety, 3 plants.—1, Mrs. Paul Moore (James T. Sisley, gdr.), Convent, N. J.

Specimen plant, any variety.—1, Miss M. T. Crocker (A. Paterson, gdr.), Saugatuck, Conn.; 2, Mrs. Paul Moore, Convent, N. J.

Group of plants in variety covering 100 sq. ft. (decorative plants permitted), arranged for effect.—1, James B. Duke, Somerville, N. J.

Collection of Hybrids, 25 plants.—1, James B. Duke, Somerville, N. J.

Cut Orchids

Collection of cut Orchids covering 50 sq. ft.—1, A. N. Cooley, Pittsfield, Mass.

Acacia, 12 sprays.—1, Jcs. E. Widener (Wm. Kleinheinz, gdr.), Ogontz, Pa.; 2, Mrs. F. E. Lewis, Ridgefield, Conn.

Amaryllis, 12 spikes.—1, Mrs. Eugene Meyer, Jr. (Chas. Ruthwin, gdr.), Mt. Kisco, N. Y.; 2, Geo. Grant Mason (Duncan McGregor, gdr.), Tuxedo Park, N. Y.

Miscellaneous Cut Flowers

Antirrhinum, 12 spikes, crimson.—1, Mrs. Percy Chubb, Glen Cove, L. I.; 2, Whippany Farms (Alfred Currie, gdr.), Morristown, N. J.

Antirrhinum, 12 spikes, yellow.—1, Mrs. Percy Chubb, Glen Cove, L. I.

Anthurium, 12 flowers.—1, Mrs. Harold I. Pratt, Glen Cove, L. I.

Calendulas, 25 flowers.—1, Mrs. Paul Moore, Convent, N. J.

Callas, 12 flowers, white.—1, C. W. McAlpin (Wm. Brown, gdr.), 2, Westbrook Gardens (C. W. Knight, gdr.), Oakdale, N. Y.

Flowering shrubs, 12 sprays, one or more varieties.—1, Peter Haupt, Jr. (Max Schneider, gdr.), East Orange, N. J.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Freeias, 25 sprays, white.—1, Mrs. Percy Chubb, Glen Cove, L. I.; 2, B. H. Borden, Rumson, N. J.

Freeias, 25 sprays, colored.—1, Mrs. Eugene Meyer, Jr., Mt. Kisco, N. Y.; 2, Mrs. Payne Whitney, Manhasset, L. I.

Lilac, 12 sprays.—1, Daniel Guggenheim, Port Washington, L. I.; 2, Miss A. DeLamar, Glen Cove, L. I.

Lilies, 12 spikes.—1, Sterling Postley, Oyster Bay, L. I.; 2, Mrs. H. I. Pratt, Glen Cove, L. I.

Mignonette, 12 spikes.—1, Mrs. Wm. Guthrie, Locust Valley, L. I.; 2, Mrs. Percy Chubb, Glen Cove, L. I.

Stocks, 12 spikes, one or more varieties.—1, Mrs. W. D. Guthrie, Locust Valley, L. I.; 2, Adolph Lewisohn, Ardsley, N. Y.

Tulips, 25 flowers, single.—1, B. H. Borden, Rumson, N. J.; 2, Mrs. H. I. Pratt, Glen Cove, L. I.

Tulips, 50 flowers, single.—1, B. H. Borden, Rumson, N. J.; 2, Sterling Postley, Oyster Bay, L. I.

Violets, 200 blooms, single or double.—1, Percy Chubb, Glen Cove, L. I.;

2, Miss Ida E. Bliss (Robt. Hopz, gdr.), Great Neck, L. I.

Vase cut flowers, not otherwise provided for.—1, W. R. Cross (A. Sailer, gdr.), Morristown, N. J.; 2, Mrs. H. I. Pratt, Glen Cove, L. I.

Wallflower, 12 spikes, any color.—1, Mrs. W. D. Guthrie, Locust Valley, L. I.

Roses in Pots and Tubs

Collection of Roses in variety, covering 100 sq. ft., arranged for effect.—

1, Adolph Lewisohn, Ardsley, N. Y.; 2, Wm. B. Thompson, Flushing, N. Y.

Roses, 6 Ramblers, any varieties.—1, Adolph Lewisohn, Ardsley, N. Y.

Cut Roses

18 Columbia.—1, Howard Cole (W. H. Fowkes, gdr.), Madison, N. J.;

2, Adolph Lewisohn, Ardsley, N. Y.

18 Mrs. Charles Russell.—1, Mrs. W. D. Guthrie, Locust Valley, L. I.

18 White Killarney, or any white sport of same.—1, Mrs. W. D. Guthrie, Locust Valley, L. I.; 2, Howard Cole, Madison, N. J.

18 Premier.—1, Howard Cole, Madison, N. J.

18 Sunburst.—1, Mrs. W. D. Guthrie, Locust Valley, L. I.; 2, Joseph H. Widener (Wm. Kleinheinz, supt.), Ogontz, Pa.

18 Mrs. Aaron Ward.—1, Countess Mildred Hahnstein (R. J. McCormick, gdr.), Edge Hill, Pa.

18 Ophelia, or any of its sports.—1, Howard Cole, Madison, N. J.;

2, Adolph Lewisohn, Ardsley, N. Y.

18 Any red.—1, Joseph H. Widener, Ogontz, Pa.; 2, Adolph Lewisohn, Ardsley, N. Y.

25 One or more varieties, to be shown in one vase.—1, Joseph H. Widener, Ogontz, Pa.; 2, Adolph Lewisohn, Ardsley, N. Y.

Carnations

25 White.—1, Mrs. Arnold Seblate, Saugatuck, Conn.; 2, Mrs. Percy Chubb, Glen Cove, L. I.

25 Light pink.—1, Countess Mildred Hahnstein, Edge Hill, Pa.; 2, Mrs. W. D. Guthrie, Locust Valley, L. I.

25 Dark pink.—1, Howard Cole, Madison, N. J.; 2, Mrs. Payne Whitney, Manhasset, N. Y.

25 Red or scarlet, to include all shades generally classed in these colors.—

1, W. B. Thompson, Yonkers, N. Y.; 2, Major L. L. Dunham, Madison, N. J.

25 Crimson, to include all shades known as crimson or maroon.—

1, Robert Mallory, Port Chester, N. Y.; 2, Mrs. Edward Holbrook, Stamford, Conn.

25 White variegated.—1, George C. Mason (D. MacGregor, gdr.), Tuxedo Park, N. Y.; 2, Mrs. F. E. Lewis (J. W. Smith, gdr.), Ridgefield, Conn.

25 Yellow or yellow variegated.—1, Mrs. Payne Whitney, Manhasset, L. I.

12 Laddie.—1, Countess Mildred Hahnstein, Edge Hill, Pa.; 2, George C. Mason, Tuxedo Park, N. Y.

Vase of Carnations not to exceed 150 blooms. One or more varieties may be used. Decorative green of any kind, ribbon and any other accessories may be used, as long as Carnations are the predominant feature. It is intended to give the exhibitor the widest latitude in making this display. Vase to be supplied by the exhibitor. Quality of bloom, artistic arrangement, and general effect to be considered in making award.—1, Mrs. Percy Chubb, Glen Cove, N. Y.; 2, Mrs. W. D. Guthrie, Locust Valley, L. I.; 3, Mrs. F. E. Lewis, Ridgefield, Conn.

Table Decorations

Tables and accessories furnished by flower show arrangement. Table set for eight, roses the only flower used. Mrs. H. McK. Twombly, 1st; Mrs. Payne Whitney, 2nd; Mrs. Ridley Watts, 3rd; Mrs. Percy Chubb, honorable mention.

Carnations the only flower.—T. Aitchison, Mamaroneck, N. Y., 1st; Mrs. Ridley Watts, 2nd; Mrs. Payne Whitney, 3rd.

Miscellaneous flowers other than those permitted in the other classes.—T. Aitchison, 1st; W. R. Cross, 2nd; Mrs. Ridley Watts, 3rd; Mrs. Payne Whitney, honorable mention.

Sweet Peas.—Mrs. Ridley Watts, 1st; Mrs. H. McK. Twombly, 2nd.

Orchids the only flower used.—Mrs. Payne Whitney, 1st; John Mitchell, New York, 2nd.

Bird Baths

Open to member clubs of the Garden Club of America. Bird bath with planting arrangement at base not to exceed seven feet by seven feet.—

Somerset, N. Y., Garden Club, 1st; Short Hills, N. J., Garden Club, 2nd; Philipstown, N. Y., Garden Club, 3rd; Bedford, N. Y., Garden Club, Garden Club of Allegheny, Pa., and the Easthampton, L. I., Garden Club highly commended.

OUR COVER ILLUSTRATION

The Spring Garden at the International Flower Show, which was awarded The Grand Sweepstakes Prize and a Special Gold Medal as the finest exhibit in the Show, and illustrated on the front cover, was the exhibit of John Scheepers, Inc.

Ordinary bedding Hyacinths of the variety Grand Maitre, porcelain blue, were used for the four principal beds; the four narrow beds on the banks contained Purple pansies with groups of the beautiful double early tulip Mr. Van der Hoeft, which is one of the finest yellow tulips available today.

In the borders Darwin Tulips and Breeders were used exclusively; the varieties used were Princess Elizabeth, undoubtedly one of the finest pink, which very agreeably combined with the flowering Crabs and Peaches underneath which they were planted.

Darwin Tulips Madame Krelage, Mr. Farncombe Sanders, Reverend Ewbank, William Copland; Breder Tulips Bronze Queen, Bacchus, Dom Pedro, Golden Bronze, Louis XIV and others were also most successfully used demonstrating the fact that many of these beautiful varieties may be so easily forced.

Against the background of tall Cedars, the Narcissus Van Waveren's Giant was massed on either side, set off with a mass effect of the very fine Darwin Tulip Victoire d'Oliviera, a splendid soft red.—Adv.

Departments of Foreign Exchange and Book Reviews

ORNAMENTAL GRASSES FOR CUTTING

Ornamental grasses impart to an arrangement a lightness and distinctive character which Fern-fronds, handsome as they are, fail to give. Moreover, it is difficult to keep up the needful amount of cut Ferns without disfiguring the plants. Most of the ornamental grasses are easily grown from seeds. We have found the following six kinds to be among the most useful, viz.:

Agrostis nebulosa and *A. pulchella*.—These come into flower early, and are about the very lightest that can be grown; they are also often sown in pots, and in this manner are useful for furnishing.

Briza maxima and *B. gracilis* are two of the best of the Quaking Grasses. We find the former to be especially valuable. This sort is also one of the best for cutting and drying for later use. If cut while the deep green tint is in it, it retains its color better than if left till it has assumed a brownish tinge.

Lagurus oratus (the Turk's-head Grass) is one of the most distinct kinds, as well as one of the best for keeping, if treated as just advised in the case of the *Briza*. For bold arrangements in association with large flowers this is an excellent kind. Another valuable grass is

Eragrostis elegans.—This is a later kind than those previously named, and comes in useful for cutting, up to the time when the early frosts spoil its color. It is a somewhat stronger sort than the others; when well grown it attains a height of from 2 feet to 2½ feet. It should, therefore, be allowed more room than the others in which to develop.

These ornamental Grasses are all valuable in their season and for preserving for use afterwards, not, however, after they have been disfigured by drying. When those raised from seed are well above the soil it will be well to thin out any kind that has come up too thickly. This will throw more stamina into those that are left, rendering them more durable.—*Gardening Illustrated*.

LILIES FOR MOIST POSITIONS

Although the fine Liliums of Japan require good drainage and a sunny border, there are various beautiful lilies which do best in a damp place, with partial shade, where their effect, when in bloom, is most valuable during the later Summer months. Peaty loam or leafmold should be added, with an admixture of charcoal, to the soil for them. *Lilium giganteum*, a noble lily of great height, is one of the best for a shady position; but it differs from other lilies in many respects, and is not often seen, for the young bulbs do not blossom for several years, and in order to obtain a flowering plant it is best to get an old one in a pot and plant it out without much disturbance of the roots. Such bulbs develop tufts of large, shining leaves and throw up a stem from 7 feet to 10 feet high, bearing about a dozen long, white flowers (which are fragrant) in August. After flowering, a large bulb produces many small ones, and these should be planted out in groups at once and allowed to mature. They are perfectly hardy, and such bulbs form fine groups, after they come to full growth.

A good contrast to this stately plant is found in *L. canadense*, which produces terminal clusters of bright orange flowers on slender stems about 5 feet high, a mass of these producing a glowing effect of color in August. Another North American lily is *L. superbum*, with spotted red blossoms; this multiplies itself very satisfactorily in a moist corner with partial shade. *L. pardalinum*, the Panther Lily, is somewhat similar, but a taller grower, reaching the height of 8 feet where full grown.

L. Humoldtii is distinguished by having purple stems about 6 feet tall, with drooping, brilliant yellow flowers, spotted with reddish purple, which persist for a considerable time in beauty. To complete the collection, *L. monadelphum* may be planted; it gives fine yellow flowers, the shade varying from rich canary yellow to pale lemon. It produces a pyramidal mass of over a dozen blossoms on stems which reach 5 feet in height. *The Gardeners' Chronicle* (British).

RHODODENDRONS AND AZALEAS

People sometimes hesitate to plant these, under the impression that they will not thrive in ordinary soil, but they really are not very particular, provided one or two requirements are observed. One is that they must not be allowed to get dry at the roots—a shady or half-shady position suiting them best—and the ground

must be free from lime or chalk, and have a fair amount of humus. They very much appreciate leafmold, and a liberal quantity of this should be mixed with the soil before planting of possible, though if this cannot be obtained they will do without it if the other conditions are suitable. One very important thing to remember is that while young they should be well mulched with half decayed leaves every year. This mulch not only feeds the roots, but helps to keep them cool, which is a most important factor when the plants are young. When they are big enough to furnish their own shade the roots will be protected, but even then the mulch is advisable for furnishing food. As soon as the flowers have faded it is well to pick them off so that seeds are not formed, as this helps the young plants wonderfully by relieving them of the strain of seed-producing.—*Gardening Illustrated*.

YUCCAS IN THE ROCK GARDEN

For the large rock garden the Yucca is very useful and looks well all through the year. I think the most suitable species for the purpose are *Y. flaccida* and *Y. filamentosa*, both fairly free-flowering, the latter the more so. When in bloom they are very handsome, and the inflorescence lasts in beauty for a long while. *Y. gloriosa* is larger and has stiffer leaves, and should not be planted in places accessible to children, because of the sharp spines at the tips of the leaves. It has an enormous spike of flowers, but is not very free flowering. The var. *Y. recurva glauca*, however, is rather more lavish with its blossoms, the spikes being as much as 6 feet high. *Y. angustifolia* is distinct, having very narrow grass-like foliage; and *Y. Whipplei*, a somewhat dwarf species, produces a magnificent spike of flowers, which last in good condition for several weeks. The Yuccas like a deep, well-drained soil, but otherwise are not all particular.—*Gardening*.

RIDDING PATHS OF WEEDS

Dissolve 2½ ozs. of Arsenite of Soda in a little water, and then add water up to 40 gallons; slake 1½ lbs. of Quicklime in a little water and then mix it in the above—adding it very gradually. This is a deadly weed-killer and an occasional sprinkling on paths should eventually kill the most obstinate of grasses.—*South African Gardening and Country Life*.

BERRIED SHRUBS OF UNCOMMON BEAUTY

Of the many families comprising the order *Rosacea* I doubt if there is one that can lay claim to so many decorative virtues or utility as does the subject of these notes. At Aldenham, where we can claim to successfully grow many treasures, the Cotoneasters are a very distinct and outstanding feature in the various portions of the gardens and grounds, and we have made the freest use possible of the various species and varieties, with their great diversity of habit and appearance.

It is a widespread family, introduced from such different locations as Southeastern Europe, Turkestan and Asia Minor, the vast snow-clad ranges of the Himalayas (from whence have come some of the most beautiful), thence *via* Thibet, through the various provinces of China and on to Manchuria and Siberia.

Not remarkable for their beauty at the flowering period, yet in good seasons they are in many cases decidedly pretty and have a charming effect when the bunches of small flowers, mostly snowy white though in a few cases pale pink, are fully open. Foliage can, however, claim higher meed of appreciation, many of the species being evergreen or sub-evergreen, and of considerable beauty, but, of course, it is the fruit that comprises the real beauty of the species in the majority of cases, being mostly bright red in color, chiefly borne in bunches of greater or lesser dimensions, though in a few cases their color is yellow, and in one or two instances black, or nearly so.

Very fine introductions have been made during recent years by the various collectors, such as Messrs. E. H. Wilson, Forrest, Kingdon Ward, Cooper and the late Reginald Farrer, though of this group I am disposed at present to plump for the first named as that of the man who has sent us the best representatives of the race so far. This opinion is, perhaps, formulated owing to the fact that, Mr. Wilson being an early starter, we have, to date, seen the best results from his efforts owing to the plants raised from the seeds he sent home having for the most part a few years' seniority over those of the others.

At Aldenham, Cotoneasters will be found in bush shape, forming beautiful beds in that part of the garden known as the Wilderness, while near by will be found other beds, in which are growing plants which have a creeping habit of growth. In other parts of the grounds will be discovered specimens which have been worked as standards and which now form small trees, some upright in growth, while others have a beautiful pendulous or drooping habit. Some will be discovered as large or small shrubs, carefully kept in check and good shapes induced by expert pruning; while in the rockgarden and on various rocky headlands situated along the course of the ornamental waters, others will be seen growing that have a beautiful trailing and carpeting method of growth, and these latter will also be found on the edges of the large clumps of ornamental trees and shrubs. One last feature must not be forgotten, and that is where they are employed for decorative work on the "Rooteries" or masses of portions of roots, and even whole tree roots, which have carefully been set up as a wandering ground for some of the more rambling and coarse-growing subjects, such as various Rubus and Polygonums, and in this portion of the ground the Cotoneasters are employed in the form of good-sized standards. It will be seen from the foregoing what a variety of uses can be found for the employment of the various Cotoneasters.—EDWIN BECKETT, V. M. H., in *The Garden*.

EVERLASTING FLOWERS

We have amongst hardy perennials, biennials, and annuals certain plants, the flowers of which do not merely give pleasure for a few days after they have been gathered, but will last for months, if cut just at the right stage. We call these—perhaps for want of a better term—"Everlasting" flowers. It is not everyone who possesses a greenhouse from which during the Winter, flowers may be obtained, but anyone having a garden can, if desired, provide flowers that at least in the depth of Winter will not fail to attract.

In the near approach of Spring is the time when it is best to make arrangements. In perennials, we have Globe Thistles, the Echinops, Sea Hollies, the Eryngiums, Physalises or Chinese Lanterns, *P. Alkekengi*, with pods or calyces of deep orange and *P. Franchetti*, with those of brilliant red. Gysophilas, too, with their graceful sprays are useful for making up, and add a touch of lightness desired. *G. paniculata*, the well known "Gauze flower," and *G. paniculata alba plena* the double form, the individual flowers of which are more pronounced. The panicles of Statice also are of service to the seeker of flowers this month, and *S. latifolia* with its miniature bluish purple blossoms is worth consideration.

One biennial at least may be counted upon to add brightness to a vase of "Everlastings." It is the time honored favorite, Honesty (*Lunaria*) with glistening silvery pods, a plant well beloved of country folk who grow it for its white and purple blossoms, but more for the pods which follow. Annuals furnish us with a few that are useful for the purpose, Helichrysums, known as Everlasting Daisies in white and crimson and yellow. Acrocliniums, a smaller daisy, and Rhodanthes more slender and fragile still, more satisfactory if grown on a warm sheltered border.

Sprays of lavender, of bracken or heather, with a few field grasses will add variety and in deft fingers make a most interesting arrangement for brightening a room in the dull season.—*Irish Gardening*.

DEPARTMENT OF BOOK REVIEWS

THE COMPLETE GARDEN, by Albert D. Taylor, M. S. A.; Doubleday, Page & Co., Garden City, N. Y.

In the case of no other book has the reviewer been disposed to give more hearty assent to what the publishers, with their very extensive knowledge and experience, claim for this work: "Whether your problem is to introduce a bit of Nature into a congested city street, or to develop large areas into a harmonious landscape setting; whether you are a professional of wide experience, and with extensive grounds under your care, or the average small home owner, laying out a back yard, you will find vital information, the exact information you need, in this, the most practical and comprehensive garden book yet published."

There should even be added, to the distinguishing features of practicalness and comprehensiveness, that of *sincerity*. In common language the work may be said to start from the bottom and to build, not upon fancies, theories or ideas, but upon knowledge of plants and their idiosyncrasies, of soils and their effects, of sites and their conditions, which vary with the weather and the seasons. The professional designer or planting contractor finds in orderly array what he needs to consider in evolving his work

for a client, it may be in a distant part of this widely extended country with its multifarious climates and growing conditions of all sorts. The designer, planter and maintainer of his own home grounds, garden or shade tree, has ready, in places most easily found with the aid of an astonishingly large and accurately detailed index, all the needed information, systematized, that he might search out, piecemeal and detached from its essential associations, in books less rational and thorough or in magazines. No detail connected with plants other than those generally regarded as greenhouse plants only, seems to have been overlooked. There is a glossary that should be welcomed and a good bibliography which includes references to reliable articles in magazines. Treatment is found of "Collected" stock, of Ornamental Plants subject to disease and insect pests, of Poisonous Plants, of Plants that Cause Hay Fever, of Fragrant Plants, of Cover Plants for all the different situations, of Shrubs for forcing in water in early Spring, of Horticultural Novelties, like those among the Rose, the Peony, the Iris, the Gladiolus and other flower families for which national societies exist, of Combinations of Color and Foliage. A few references to the index, which, by the way, appears to contain the first publication of the names of plants as revised by the American Joint Committee of Horticultural Nomenclature, to such topics as Annuals, Bulbs and Winter, would convince one of the completeness of the work. But it is not made up of isolated items like a dictionary or encyclopedia. The book is a connected and coherent whole, enjoyable to read, excepting perhaps, for some, the interspersed lists of plants, and made attractive by its many illuminative pictures, pictures in which one is enabled readily to see what is illustrated by well chosen explanations that are appended. Those in color are exquisite.

The book should find cordial reception among landscape architects and professional gardeners, many of whom will undoubtedly respond to the author's invitation to aid in making the work an entirely satisfactory and sufficient epitome of what should be known for the successful handling of all kinds of ornamental plants. The publishers are apparently confident that the book is destined to be standard, for they expect so large a sale that they have made the price remarkably low for so large a volume, one that measures seven inches by ten, with so many fine pictures upon its nearly 500 pages.



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NEW SUSTAINING MEMBERS

F. H. Stoltze, Minneapolis, Minn.; Mrs. K. S. Goodrich, Cranford, N. J. (John Thompson, gardener); Harry G. Haskell, Wilmington, Del. (John T. Whittaker, gardener), have become sustaining members of the association.

PUBLICITY FROM NEW YORK FLOWER SHOW

The booth maintained by the National Association of Gardeners at the International Flower Show, Grand Central Palace, New York, last month, brought considerable publicity to what the aims and purposes of the association are. Estate owners from different parts of the country visited the booth to learn of the association's activities. A large quantity of pamphlets, briefly outlining the association's aims and containing the list of sustaining members, were distributed; also pamphlets on the association's campaign to suppress the sign board nuisance along our highways, which aroused much interest. Although the Secretary was unable, owing to a physical breakdown, to attend after the second day of the Show, his able assistants, however, proved capable of handling the association's affairs.

NEW ENGLAND CONFERENCE.

Many members were disappointed in the postponement of the New England conference which was to have occurred on April 8 in Boston in connection with the Spring Flower Show of that city. When it was learned that the Secretary could not attend owing to ill health, it was decided to postpone the conference until a later date, at which time he could be present. As this was a last minute decision, it could not

be made known to members at large, with the result that about one hundred members, some from a distance, visited the Show on April 8 with the intention of attending the conference.

THE NASSAU COUNTY, N. Y., LOCAL BRANCH.

The promoters of the Nassau County branch of the National Association of Gardeners have decided to call a meeting the early part of May to organize and to pass on the activities the branch is to engage in. The meeting has been set for that time to enable the Secretary to be present to answer questions pertaining to the work of the association.

THE COMMITTEE ON TRAINING YOUNG MEN

A meeting of the committee on training young men for the gardening profession, was held in New York during the Flower Show, at which meeting Montague Free of Brooklyn, Vice President George H. Pring of St. Louis, and H. Ernest Downer of Poughkeepsie, were present. Tentative plans for an educational program were drawn up which will be submitted to the next convention for consideration.

THE SIGN BOARD CAMPAIGN

The Sign Board Committee has issued an interesting pamphlet on the campaign to suppress the sign board nuisance along the highways. Thousands were distributed at the New York Flower Show, and also at the Boston Flower Show. That the public is thoroughly aroused is made evident by the many offers of co-operation that have already come to hand from influential people, and also from institutions. Members desiring these pamphlets to distribute in their communities, can secure them by addressing the Secretary. The Committee seeks the co-operation of every member.

The following interesting communication appeared in The Garden Magazine for April:

To the Editor of The Garden Magazine:

Having read of the resolution condemning billboards adopted by the National Gardeners' Association, at their meeting at St. Louis, I thought it would interest you to know that when traveling to Salt Lake City, to attend the sessions of the Farm Women's National Congress, we were so annoyed by the big sign boards that spoilt so much of our view of the scenery, that we hurriedly drew up a short resolution expressing our feelings. We were plain farm women, and used no extra phrases, just short and to the point; we did not know these sign boards had annoyed any one else as they did us. One of our party exclaimed, "I never will buy a * * * car, because I will always think how that big sign board up on the mountain side cut off the scenery so many many times."—Mrs. Theodore Saxon, Topeka, Kan.

AMONG THE GARDENERS

Robert Creighton has accepted the position of gardener on the Mrs. Joseph H. Choate estate, "Naumkeag," Stockbridge, Mass.

Frank Darrah secured the position of superintendent on the estate of E. Richard Meinig, Wyomissing, Pa.

William Portman accepted the position of gardener to A. W. Tutill, Sioux Falls, S. D.

William J. Chalmers, formerly of the William E. Iselin estate, New Rochelle, N. Y., accepted the position of gardener to A. K. Lawrie, Williamstown, Mass.

J. C. Armstrong secured the position of superintendent on the estate of Mrs. George W. Elkins, Ways Station, Ga.

William Thomson accepted the position of gardener on the James C. Brady estate, "Hamilton Farms," Gladstone, N. J.

Donald B. Sutherland has been appointed head gardener to the Christian Science Benevolent Institution, Chestnut Hill, Mass.

Charles Valentine, recently gardener on the J. A. Forster estate, Hackensack, N. J., accepted the position of superintendent to E. D. Morgan, Westbury, L. I.

Alexander White secured the position of gardener to John Gribbel, Wyncote, Pa.

Theodore Petersen secured the position of superintendent on the I. L. Kuser estate, Bernardsville, N. J.

John H. Kullman accepted the position of gardener to H. S. Sherman, South Euclid, O.

Carl Sarling secured the position of gardener to John Agar, New Rochelle, N. Y.

F. Sorge secured the position of gardener to Dr. Mozart Monæ-Lesser, Manhasset, L. I.

Herbert Woodger secured the position of gardener to A. D. Brixey, Greenwich, Conn.

Ross Gault accepted the position of gardener to Mrs. James Bowen, Southampton, L. I.

G. Bainbridge resigned his position as gardener to Mrs. H. A. Stillwell, Lake Geneva, Wis., to accept the position of head gardener on the Hertz estate, Cary, Ill.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD

At the March meeting of the above Society, an address by the secretary, O. Addor, on "The Responsibilities and Opportunities of the Gardener," proved to be very interesting.

His main point was the urging of horticultural societies to take more interest in community work, our members in particular being asked to do everything possible in helping the small home owner to make his surroundings attractive and beautiful. He advocated members giving advice and timely suggestions, saying it would be greatly appreciated by those people who are always eager to receive advice from a reliable source. He called attention to one of our neighboring societies which has inaugurated open meetings for visitors who are interested in horticulture. Under this scheme they will be able to hear lectures on various subjects and also ask questions. If this proves a success, it is quite probable our Society will follow suit. Influential townspeople of Greenwich have started a Boys' Club as a means of keeping the little fellows off the street and one of our members has been delegated to wait on these leaders to urge them to place gardening on their schedule. Garden work has proved the most congenial occupation and has worked more successfully with the boys in other cities than any other occupation, and if we can get them interested, it may mean that some of them at least may take up gardening as a profession.

When you start thinking about your Dahlias, think also of the show this Society is going to hold in September at New Rochelle.

GEORGE HEWITT, Cor. Sec.

LAKE GENEVA, WIS.

At a recent meeting of the Society, the following were elected: R. Sampson, re-elected president; F. Brady, vice-president; Axel Johnson, re-elected treasurer; W. McKinnon, secretary.

Directors elected: R. Sampson, Axel Johnson, F. Brady, W. Longland, A. P. Montgomery, R. Niles, J. Baldson, G. Bainbridge.

MORRIS CO. (N. J.) G. AND F. SOC.

There was a good attendance at the monthly meeting March 24. The monthly essay was omitted as the society had considerable business on hand. A. Herrington and C. H. Totty spoke of the New York Show and their experiences there, also thanked the members for their help this year and in the past. Silver cups are still

coming forward for the Society's Jubilee Show, the total offered now being nineteen and more are forthcoming. J. F. Piper made a motion that the society should encourage the monthly exhibit by presenting the competitor scoring the largest number of points with medals or suitable presents for their efforts. This motion was unanimously accepted by the members. Two new members were elected.

J. F. P.

NASSAU CO. (N. Y.) HORT. SOC.

The monthly meeting of the above society was held on March 9. President William Noonan occupied the chair. Two petitions for active membership were received. The committee reported the schedule for the Tulip Show and from the variety and number of classes, all should be able to compete. The society held its annual dinner on March 15. Mayor James Burns, of Glen Cove City, acted as toastmaster. About 100 members and guests lined the festive board. Mayor Burns presented a small token from fellow members to Ex-president Twigg.

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SEWICKLEY (PA.) HORT. SOC.

The regular monthly meeting was held March 8, President John Carman presiding. The committee on the Way Park improvements reported a conference with the Borough Engineer, who concurred in the suggested plan of improvements submitted by the committee. A communication was read from Mrs. Brooks, chairman of the Board of Directors of the Allegheny Garden Club, offering its support and co-operation in connection with the proposed Fall flower shows and asking that the society submit them a tentative program.

A resolution was passed thanking the Woman's Club of Sewickley Valley for its cordial invitation extended to the members of the society, to attend an illustrated lecture given by Arthur Herrington in the Edgeworth clubhouse.

HENRY GIBSON, Asst. Secy.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Will you please tell me how thick an apple tree grown from a seed should be before grafting it? Is a tree that is a little over a year, and nearly three feet high all right if it has not started to branch yet? How high should the main stem be before pinching back if I want such a tree? Is there any way to make the tree thicker or is it healthy when it is just a slender stem at a little over a year? What is the best fertilizer to use to help a single apple tree to grow?—M. K.—Texas.

A seedling of the above age would naturally not be very thick, if a quarter of an inch in diameter it has done extra well. The usual practice is to bud during the second year during August and September or later. The bud should be inserted close to the ground and after the bud has made some growth the stem above it removed. Root-grafting used to be very commonly practiced but it has gone out of use more or less. If it is in ordinary garden soil, plenty of water and clean cultivation should produce normal growth. If the soil is sandy and deficient in humus, forking in some rotted stable manure would be beneficial, together with a table-spoonful of nitrate of soda as soon as growth starts and again in June. On very sandy soil nitrate of potash (saltpetre) may be substituted for nitrate of soda. Pinching out the terminal bud of a stem or shoot may be done at any height it is desired for branches to be thrown out, irrespective of the stem's thickness.—A. S.—N. J.

STAMFORD (CONN.) HORT. SOC.

The regular monthly meeting was held April 4, with Henry Wild in the chair. It was reported that one life member has offered to give to the society \$14,500 with the stipulation that the members raise between themselves a like amount. Every member present at the meeting, therefore, became a life member by giving fifty dollars toward the proposition and there is no doubt that before the end of May the money will be raised. This will free the society's hall from all encumbrances.

G. C. BROWN, Cor. Secy.

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(*Malus* s.)

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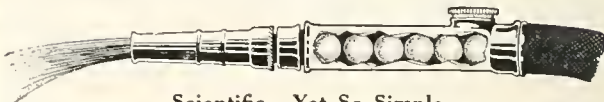
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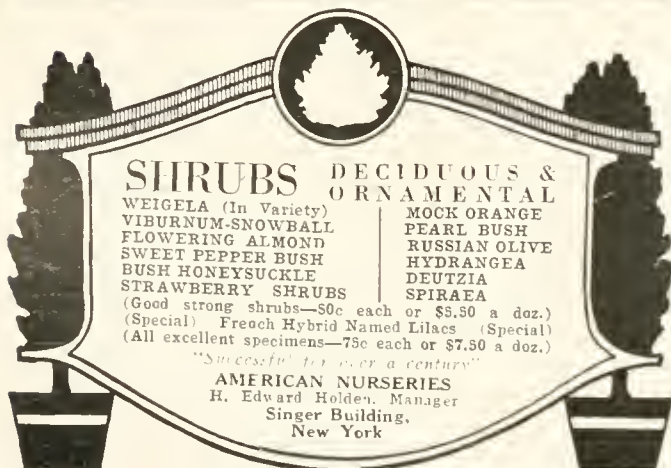
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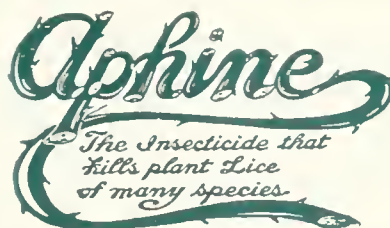
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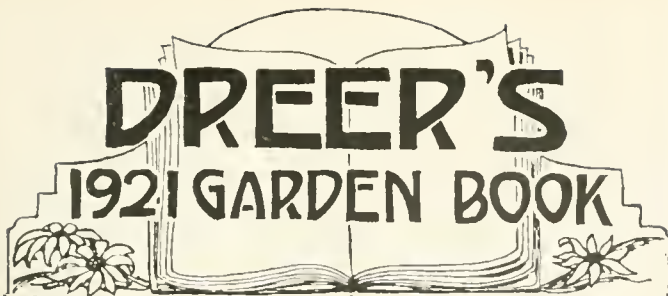


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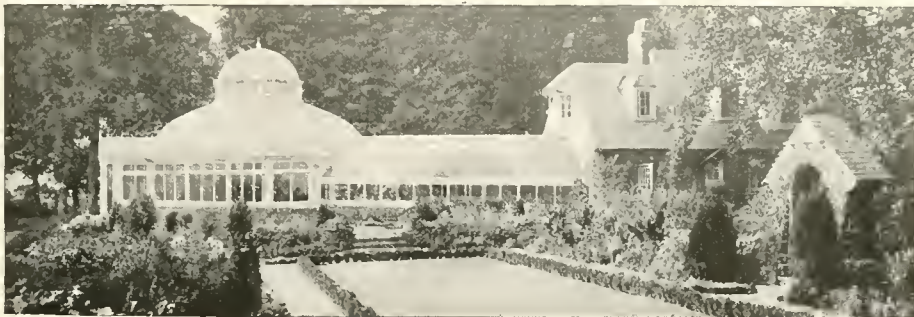
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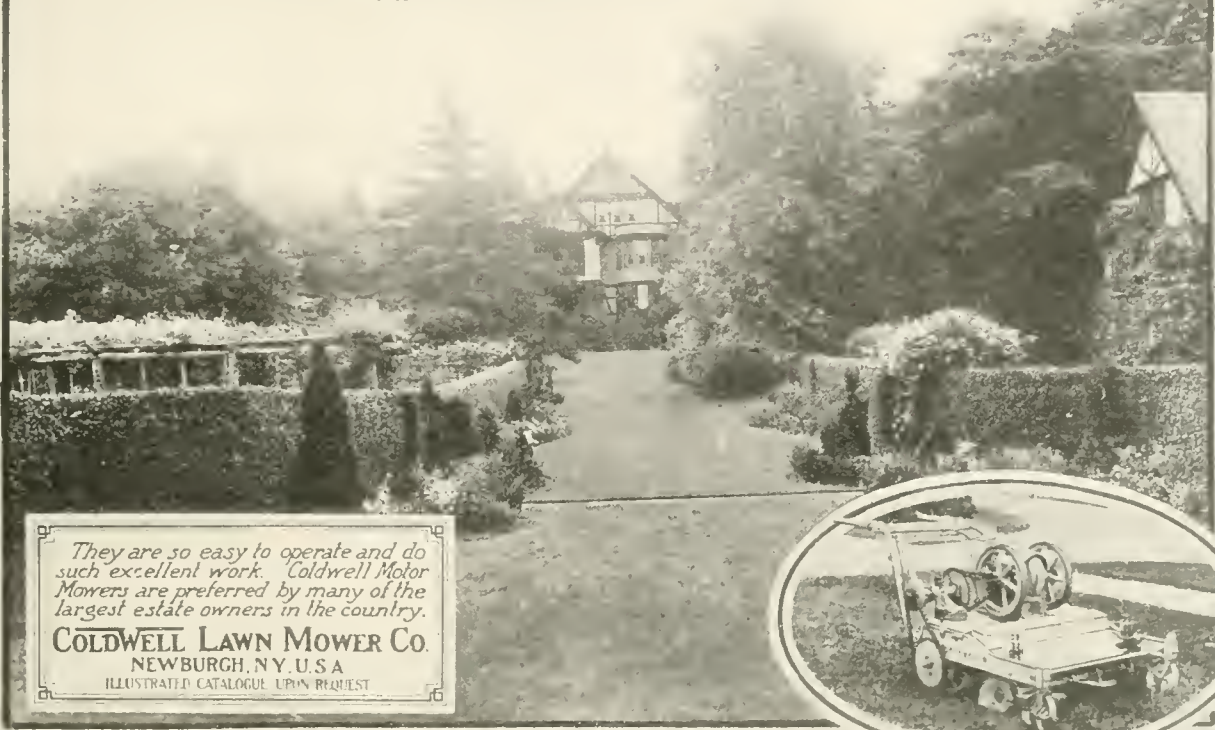
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

MAY, 1921

No. 5

Things and Thoughts of the Garden

MONTAGUE FREE

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BOTANICAL
GARDEN

MAY, the merry month, the month of months for those who find their greatest pleasure in the enjoyment of the beauties of living plants, is the month when the well-planned and planted rock garden is at its zenith. Although at this season there is no lack of inviting loveliness in other parts of the garden with Iris and Tulip, Azalea and Lilac, displaying their opulent charms, the denizens of the rock garden have no difficulty in compelling attention to their manifold attractions. This month sees many of the Saxifragas at their best; the alpine Forget-me-nots, when massed, display themselves as a fairy sea of pale blue; and *Daphne cneorum*, the specific name of which is a pitfall for novices whose pronouncement of it is usually a cross between a sneeze and an ass's bray, shows its umbels or rosy pink blooms. Many lovely Veronicas charm with their daintiness; the Aubrietias still continue in bloom, whilst Primroses and their relatives the Rock Jasmines with many of the stitch-wort family, *Dianthus*es (or *Dianthi*, if you so prefer); Cerastiuns, Gypsophilas and Arenarias, with innumerable others, combine to make a magnificent display.

* * *

Speaking offhand one would say that the genus *Saxifraga* contains more species suited to rock planting than any other. On looking up Robinson on this subject the above statement receives some confirmation from the opening sentence of the article, in the English Flower Garden, on *Saxifraga*. "This genus includes perhaps more true alpine flowers than any other." Mr. Lown in his wonderful garden at Poughkeepsie, which in all probability contains the best collection of alpine plants in this country, and is the Mecca of all alpine enthusiasts, has many species of *Saxifraga*, even of those kinds thought to be difficult, which he considers thoroughly established.

Great variation is to be seen in the many sections of *Saxifraga*—in the time of blooming, habit of growth, and color of flowers. *S. Burseriana* unfolds its glistening white flowers and defies the vagaries of weather in mid-March; and the airy panicles of *S. Fortunei* are to be seen gaily dancing in autumnal gales. The lowly *S. oppositifolia*, found on high mountains all over the North Temperate zone, and in the Arctic Circle, whose prostrate stems, clothed with tiny leaves, closely hug the ground, and the still more diminutive *S. cæsia* are in great contrast to the rank lush growth of the *S. pennsylvanica*, which attains a height of three or four feet, and the imposing umbrella-like leaves a yard high and a foot or more across of the Californian *S. peltata*.

The colors range through pure white of such species as *Burseriana* and *longifolia*, shades of yellow in *Boydii* and *apiculata*, the pinks and reds that have been developed in many of the "mossies," to the purple of *S. oppositifolia* and *S. lilacina*. Many of the *Cotyledon* section have white flowers beautifully spotted with carmine and these are among the easily grown members of the genus.

For some reason or other the impression seems to be abroad among American gardeners that the Saxifragas are miffy and difficult to grow in our climate, and it has been said that it was impossible to get the "mossies" to do well under cultivation here. Such is not the case. Given suitable conditions, deep, well-drained soil mixed with broken rocks, with a good supply of humus, plenty of water during the growing season, a few flat stones on the surface to keep their roots cool, many of the mossy Saxifragas, including the latest products of the hybridist, will grow like weeds. So far as nomenclature is concerned this section—which, by the way, is divided into many subsections—is often a source of considerable perplexity to the gardener when a large collection of them is maintained. The differences that distinguish some of the species are somewhat obscure, and environmental factors will often cause a great change in their general appearance. In addition they hybridize freely with each other, the seeds germinate readily wherever they happen to fall and the result is sometimes provocative of profanity in the gardener who wishes to keep his collection correctly named. The only way to be sure of keeping them true to name is to prevent seeding and to propagate entirely by cuttings. This, fortunately, is an easy matter as the individual rosettes root freely if taken in July or August and will provide flowering plants for the following Spring. This was the method followed at Kew to produce blossoming material in pans for the embellishment of the Alpine House—a purpose for which these plants are well adapted.

No one should be deterred from growing "mossies" because of difficulties with nomenclature. After all, the plants are more important than the name, although many botanists seem to think otherwise, and we can exclaim with Shakespeare, "What's in a name?" so long as the plants fulfil our requirements of providing beauty and interest.

It must not be inferred from the foregoing that none of the species in this group possess distinctive characters; many of them stand out boldly from among their fellows and there is no difficulty in determining such species as

S. trifurcata, *S. Camposii* and many others from their foliage alone in case of necessity.

Leaving the "mossies" we come to the *Diptera*. This comparatively small section contains at least two species suitable for rock garden planting which demand nothing out-of-the-way in their culture. *S. Fortunci*, the Fall blooming kind, which has already been mentioned, thrives in woody soil in half-shade and gives abundant flowers at a time when flowers are scarce in the rock garden. This easy doer ought to be in every collection. The other species is the well-known Mother of Thousands, or Strawberry Geranium *S. sarmentosa*. This is usually looked upon as a greenhouse plant; but it survives mild Winter out-of-doors here in Brooklyn, and in any case it propagates so rapidly, that it is an easy matter to work a new stock should it happen to Winter kill.

The section *Euaizoonia*, which includes such species as *S. Cotyledon*, *S. Macnabiana*, and *S. lantoscana*, among the handsomest in the genus, contains many that are quite complacent under cultivation. Porous soil, with broken limestone, and a sunny crevice in a position where they do not suffer from lack of moisture at the root, fulfills their requirements. *S. Cotyledon* possesses potentialities as a pot plant in the cool house for it freely produces its pyramidal panicles of white blossoms when grown in five or six-inch pots. These panicles on well-grown specimens attain a length of two feet or more and it is easily the best of the larger Saxifrages. Some claim this distinction for *S. longifolia*, often called the "Queen of the silver Saxifrages," but this species is much less tractable, and, under cultivation, is usually a particularly shy bloomer. It is, however, worthy of a place in the rock garden if only for its lovely rosettes, made up of innumerable narrow leaves of a silvery hue. *Saxifraga Aizoon* and its varieties, of which there are over a score, are quite tolerant of our conditions. When planted in well-drained soil most of these *Aizoon* forms soon develop into sizable tufts of silvery rosettes. Not all of them may be expected to produce an inflorescence, but this does not seem to be a matter of great importance when we consider the beauty of their distinctive foliage at all seasons of the year. Few plant species exhibit greater variation than this, and the differences in the size of rosette, habit of growth, and color of flowers, cause one to wonder if the taxonomists are correct in grouping these unlike forms together under *S. Aizoon*.

The plants in this and a few other sections, have their leaves encrusted with lime which gives the foliage a distinctive appearance, especially when, as often happens, these chalky exudations are concentrated on the margins. This peculiarity is a great help to the gardener as it indicates at once, so far as my experience goes, that the plant is a lime lover, and he can take measures accordingly.

The *Kabschia* section contains some of the most striking members of the genus, and, some of the meanest to handle from the cultural standpoint. Many of them, such as *S. Grisebachii* and *S. media*, can only be considered as plants for the connoisseur and must be passed by, regretfully, by those who lack specialized knowledge and the time to minister to their capricious demands. Several species, however, have been grown successfully in Eastern North America, notably *S. Burseriana*—one of the best. There are many garden forms of this species, some of which may be considered improvements on the type. The variety "*Gloria*" is all that the name implies and the variety "*major*" is also desirable.

Charming hybrids have been made between many of the species of this group. A good example is the diminutive gem known as *S. Roydii* which forms tiny tufts of spiny foliage topped with clear yellow flowers about an inch in diameter, arising to a height of only two inches

above the ground level. This delightful product of a cross between *S. Burseriana* and *S. arctioides* makes one sigh with regret that it does not properly appreciate the beauties of our climate. Farrar, having in mind English conditions, describes it as "a plant of evil and uncertain habits." One can scarcely hope that these exacting little alpinists will ever become plants for the millions, but one may be permitted to hope that their cultivation will not present insuperable difficulties to those who are sufficiently interested to cater to their somewhat exacting requirements. The greatest chances for success with these difficult subjects seem to be in raising them from seeds.

The *Pophyrion* section includes *S. oppositifolia* and *S. rectusa*. The former makes a dense carpet of dark green foliage covered in Spring with rosy purple blossoms. We will be glad to hear from anyone who has made a success of it in America. It must be admitted that all our attempts, both from plants and from seeds, have resulted in ignominious failure. What an addition to our rock garden this, and its varieties, would be if they could only be persuaded to overcome the nostalgia that they seem to experience when confronted with our torrid Summers!

There are still many other sections that must be passed by on this occasion with but scant notice. The section *Bergenia*, for example, which includes the leathery leaved *S. cordifolia*, contains plants of value, and *Miscopetalum* whose most noteworthy members are *S. rotundifolia*, a strong growing species with clouds of white flowers in airy panicles, and *S. taygetea*, a dwarfer kind more in keeping with the general aspect of the "rock garden."

The number of species belonging to *Saxifraga* is large. The Standard Cyclopedia of Horticulture says: "About 400 species from horticultural viewpoint, or approximately 250 botanically speaking."

Many possess great merit as garden plants and almost all of these can with propriety be used in the rock garden as they fulfill Farrar's definition of a rock garden plant—one that does not look out of place there—even though all of them are not alpine or saxatile in nature.

* * *

When glancing over the Things and Thoughts of the Garden article as it appeared in last month's CHRONICLE, a severe shock was experienced when the words *Aster Nova Eboracca* came into view masquerading as the scientific name of the New York Aster. A guilty feeling at once possessed us as we came to the conclusion that the typist had been misled by our faulty caligraphy and then the error carelessly allowed to slip by. But, on referring to carbon copy of typescript the name in question was there seen to be correctly typed—*Aster Novi-Belgii*—and so the blame for the mistake must be passed on to the individual who is usually, and sometimes unjustly, made the goat for such errors—the printer. In this case, however, there seems to be but little doubt that he must justly be called upon to shoulder the blame. We are anxious to make this correction lest by chance any reader should think we are trying to inaugurate a new system of naming plants. As one who suffers in the endeavor to keep track of the latest developments in botanical nomenclature, we earnestly disclaim any such intention.

We are still perplexed and totally unable to understand how *Novi-Belgii*, plainly typewritten, could be transformed into *Nova Eboracca*! Is it possible that some one had in mind the New York Fern, *Aspidium noveboracense*?

Harbor no thought, neither do any act, you would be unwilling the whole world should know.

—Albert Mattheews.

Annual and Biennial Plants—Some of Their Uses

ROBERT CAMERON

(Continued)

ANNUALS are generally divided into two classes, hardy and half hardy. Then we have the greenhouse classes, but it is not my purpose to mention them now. Hardy annuals are the kinds which are sown directly in the ground where they are to grow. Some can be sown in the Fall and wintered over in frames. Half hardy annuals are those which are sown in the greenhouse, frame, or window in March or April. They need slight protection in the early stages of their growth and some of them do not develop to their full extent if not treated in this way.

Ageratum conyzoides is the common *Ageratum* of gardens. It is a favorite because of its bright blue flowers which are produced all Summer. The tall varieties grow about eighteen inches high, but there are several dwarf varieties which are very useful for massing, edging plants and for ground coverings. These are Swanley Blue; Imperial Dark Blue, this variety is nine inches high; Little Blue Star, a beauty only six inches high. There is also a dwarf white variety.

Sweet Alyssum is undoubtedly the best low, white, annual plant we have for borders, especially valuable on account of its pleasant fragrance. It is best to sow this seed early out of doors where the plants are to bloom. If the plants begin to run to seed, the flowers can be cut off and the plants will soon blossom again and continue to the end of the season.

The snapdragon, *Antirrhinum majus*, is very popular and deserves to be on account of its handsome flowers which are produced very abundantly. It is one of the most useful annuals we have in the garden. Being one of the plants which have been very much improved by horticulturists, the snapdragon has now a great range of beautiful, distinct colors. Not only have the colors of the flowers been improved, but also the habit of the plants. We have them in tall and dwarf forms coming true from seed, with many varieties among the latter. For early flowering, the seeds must be sown in February or March in the greenhouse. The seeds sown out of doors in May will flower in July or August. The flowers are especially good for cutting and possess good keeping qualities. In warm sheltered positions this plant occasionally lives over the second year.

Balsams are beautiful plants when well grown, and by selection and improvement we have a large variety. A good strain will give plants, producing large, double flowers. If sown out of doors in warm sheltered spots about the end of May, they soon germinate and develop into fine specimens, but they must have sufficient room to grow.

Browallia elata and *grandiflora* are old-fashioned plants that are easily grown, valuable on account of their fine showing of blue flowers all Summer. They are particularly useful in the flower garden, where they will bloom from June until October.

There are few plants that are more satisfactory than the annual *Corcopsis* for they will grow and flower in almost any kind of soil or situation. If sown out of doors in May, they quickly begin to flower and will continue blossoming until they are destroyed by frost in the Fall. The best kinds are *finctoria* and *Drummondii*.

The pot marigolds, *Calendula*, are very valuable for growing in light and dry soils and have many pleasing shades of yellow flowers. They may be sown quite early

out of doors, continuing to bloom until Fall. The flowers are good for cutting. The finest varieties are Meteor, Prince of Orange, and Lemon Queen.

China or Indian pinks are biennials but if sown early they flower the first year from seed. When given a sunny position in the garden they make an excellent display, flowering from July until frost. Good varieties are Fireball, Purity, Salmon Queen, Snowdrift and Vesuvius.

Nasturtiums are general favorites as no soil is too poor to grow them in. The dwarf kinds are best adapted for beds and massing, and the tall *Lobianum* varieties are the best for picking flowers from. A marvellous range of new colors has been developed in this flower. Some good varieties of the dwarf kinds are Aurora, yellow; Crystal Palace Gem, yellow and carmine; King of the Tom Thumb, scarlet; and Ruby King, dark red. Among the tall climbing kinds, Jupiter, gold yellow; Sunlight, light golden yellow; and Vesuvius, salmon colored, are choice varieties to grow. Of the *Lobianum* varieties, Asa Gray, yellowish white; *Fulgens*, dark scarlet; *Lucifer*, very dark scarlet; Spitfire, brilliant scarlet; and Marguerite, cream white, are the most well liked.

Ten-week stocks are charming plants for borders and their handsome flowers are excellent for cutting. There are many pleasing shades of these flowers, ranging from dark red to snow white. The "Cut-and-Come-Again" varieties are especially good for cutting, as when the first flowering shoots have been cut, the side branches produce good cutting material. The Autumn and late flowering kinds are not as useful as they bloom too late.

The candytufts are splendid for edging and massing effects, and the varieties, Empress, Little Prince, and Giant White Perfection, are among the best. Sow out of doors early in Spring and for succession, sow late in the Summer.

The cornflowers, *Centaurea cyanus*, are extremely hardy annuals and will stand out of doors all Winter. The light, airy blue flowers are charming for cutting, as are also the white flowered and pink flowered varieties. The Sweet Sultans are useful for massing, and cutting, and of late years we have had many new varieties which are exceptionally fine garden plants. *Centaurea Margaritha* has pure white flowers which are very fragrant. The different forms of *Centaurea imperialis* are very valuable for cutting and they keep well. They are grown by florists a good deal but for general garden use they should be grown much more extensively.

The Summer-flowering Chrysanthemums are not like our large Autumn-flowering kinds, but they possess a charm of their own and no garden should be without them. They are of easy culture, coming into flower quite early enough if the seed is sown in May. There are many varieties, some having so-called double flowers. *Chrysanthemum carinatum* or *tricolor* makes a bushy plant from one to two feet high and its flowers are composed of three colors. The best varieties of this species are *Burridgeanum* and Eclipse. The double forms of *Chrysanthemum coronarium* are the best. The Corn Marigold, *C. segetum grandiflorum*, is a taller growing plant than the former kinds, excellent for massing and cutting. Sutton's Star varieties are the finest of all, Morning Star, Evening Star, Eastern Star, and Northern Star. The dwarf *Chrysanthemum multicaule* makes a good edging plant.

In low growing plants for yellow effects, we have noth-

ing better than the Californian Poppy, *Eschscholtzia californica*. To have it thrive well, seed must be sown early in Spring. It is very impatient of transplanting and must be left alone. The finest kinds would include, *crocea*, Golden West, *tenuifolia*, and *maritima*.

The annual Gaillardias are well adapted for Summer gardening as they produce their flowers all Summer. *Amblyodon pulchella*, and *pulchella* var., *picta* are the best.

Cosmos is one of the finest annuals we have in mid-Summer and Fall. Much has been done of late years to have the plants bloom earlier and the size of the flowers has also been improved. We have now early flowering kinds, mid-Summer and late Fall flowering, and also double flowered varieties. What we need now is the improvement of the habit of the plants.

The annual Larkspurs are showy plants when well grown, very valuable for cutting. They thrive best if sown very early out of doors and given plenty of room to develop: are strong growing plants, enjoying rich soil. There is a great range of color, including shades of light, dark and azure blue, white, rose, pink, red lilac, dark lilac and violet. The variety known as Newport Pink, which was introduced a few years ago, has rose colored flowers and is well worth raising. The choicest varieties are now grown in the Winter in the greenhouse for cut flowers.

The best of our garden poppies originated from the corn poppy, *Papaver Rhoeas*. The carnation, picotee and ranunculus poppies are double forms of this species as are also the Shirley poppies. The corn poppy is the common wild poppy of Europe which grows abundantly in the fields there and which is found so plentifully in France. This is the poppy which Col. MacCrae referred to in his never to be forgotten lines:

"In Flanders' fields the poppies blow
Between the crosses row on row."

The Shirley is a charming race and was obtained by selection. They are the most lovely of all the poppies and are of every imaginable shade and combination of white, pink, and red with yellow anthers. There are double flowered varieties of this species. The opium poppy, *Papaver somniferum*, has some pleasing shades and the pæony-flowered poppies belong to this plant. The range of color in this species and its varieties run from white through pink and red to purple. Bride and Flag of Truce are good single white forms; Danebrog is a wonderful, single variety of the richest scarlet with a white cross at the base of the petals. Mephisto is a beautiful-fringed variety varying from red and black to rose and white. The double forms are all delightful and well worth growing, but we like the single kinds best. For gracefulness, airiness and poise, and delicacy there are no annuals that excel the poppies. Poppies present a most gorgeous sight when they are grown liberally. Many are good for cutting and not nearly as fugacious as Robert Burns had them in his simile when he said:

"Pleasures are like poppies spread,
You seize the flower, the bloom is shed."

If, just as the flower is opening, the stamens are taken out, the flower will last much longer when cut. To obtain good results they must be sown out of doors whenever the frost is out of the ground in Spring, covering the seeds very lightly. Thin out the plants well, allowing plenty of space for development. They do not stand transplanting.

The Marvel of Peru, or Four o'Clock, is a perennial in its native country, but is raised here as an annual, thriving and flowering in any kind of soil or situation. Four o'Clock will do well under the shade of trees.

Petunias are very attractive and easy to grow. For massing or bedding we have nothing better because they flower continually from July to frost. They are not fastidious about soil and will grow almost anywhere. The large flowered variety, called Ruffled Giants, is magnificent with very large, beautifully marked flowers. Countess of Elsemere is a good bedding variety and, although the flowers are not as large as some kinds, they are produced profusely and are of a pleasing pink color. Rosy Morn is one of the best, a light pink color, and well adapted to many uses. White Pearl is an excellent, single flowered, white variety. Violet Queen is a superb variety of a rich, violet blue.

Drummond phlox, when sown in masses, gives very brilliant effects: is easy to grow from seed, and remains a long time in bloom. As phlox contains almost all shades of color and is so compact in habit, it adapts itself to many purposes. If given plenty of water and if relieved of the seed pods when formed, the plants last in flower longer than usual. They are much better for cutting than the perennial kinds. The *grandiflora* forms are by far the best: the flowers are larger and better shaped than the old kinds. The *cuspidata* varieties are pretty and interesting on account of their star-shaped flowers. Sutton's Purity, Pink Beauty, Mauve Beauty, Snowball and Fireball are the most admirable of all the Drummond phloxes.

The African and French marigolds, *Tagetes*, are natives of Mexico and are so well known that we hardly need to mention them. They are very valuable for late Fall and it is then that they appear at their best. There are many fine varieties, the dwarf kinds being very compact and striking for beds. *Tagetes signata pumila* is well worth growing on account of its dwarf habit; it does not attain more than one foot in height and is completely covered with small yellow flowers.

We must not forget Mignonette. No garden should be without this old-fashioned, fragrant plant. The seed may be sown early in Spring and later another sowing may be made for succession. Almost any kind can be recommended but those that are the most fragrant in the garden are the best.

For low growth and brilliancy of color we have nothing to surpass *Portulaca*, excellent for beds and edgings, and one of the easiest plants to grow.

For large, imposing flowering annual plants, the sunflowers are superior to all others. There are several species which are not grown as widely as they ought to be. The silver-leaved sunflower, *Helianthus argophyllus*, growing four or five feet high, has handsome, silvery foliage with beautiful, single flowers. The cucumber-leaved sunflower, *Helianthus cucurbitifolius*, is the most handsome of all the annual sunflowers. It has compact growth and produces an immense number of single, bright orange flowers. The varieties, *Stella* and *Orion*, are very decorative and their flowers are good for cutting.

The China Asters, *Callistephus hortensis*, are among the most common of all the annuals. Of the easiest culture, they can be had in a large number of forms and colors. The history of the evolution of this plant is very similar to that of the *Chrysanthemum*. When it was introduced it was a single flower, and it is pleasing to note that there is a growing fondness for single flowered forms again. They are subject to several diseases, but the diseases which attack the roots are avoided, if the plants are not grown on the same piece of ground two years in succession. The fungus diseases which attack the leaves can be held in check by spraying with some of the copper fungicides. Spraying the plants should begin

before the disease appears and should be repeated about every ten days. Among the well liked kinds are Comet, American Branching, Queen of the Market, Victoria and Crego's Giant Asters. The single varieties are truly beautiful in the garden and are good for cutting.

Probably the most important of all the annuals are the sweet peas with their innumerable varieties. Every year new kinds displace some of the older ones. Sweet peas, which require thorough cultivation, deep digging and liberal supply of manure, should be sown as soon as the frost is out of the ground. We sow the seed in boxes in March and when a growth of half an inch is shown, prick them off into 4 inch pots. In this way one secures more even growth in the pots. They should be planted whenever the weather is favorable which would probably be some time in April. For white, grow Constance Hinton, Mascott's White, White Spencer; for yellow, Primrose Queen, Hon. Mrs. E. Kenyon; for orange shades, Helen Lewis, Barbara, Edrom Beauty; for pink shades, Hawmark Pink, Illuminator, La France, Annie Ireland, Countess Spencer, Hercules; for red shades, Thomas Stevenson, Queen Alexandra, Scarlet Emperor, Robert Sydenham, King Edward VII. For blue and lavender the following are good, Florence Nightingale, R. F. Ferton, Capt. of the Blue Spencer, Imperial Blue, Lord Nelson, but as there are numerous kinds, and everyone has his likes and dislikes, there is no use in making too long a list.

Zinnias are very valuable as they come into flower early in the season and continue blooming until frost comes. Their great brilliancy makes them especially fine for beds and masses. There is such a variety in the different heights that one can secure zinnias which are adaptable for all purposes. The double forms of *Zinnia Haageana* are very good for yellow flowers.

Sweet Scabious, which makes an excellent plant for borders, is to be had in various colors, including white.

Salpiglossis, a very splendid plant, needs care in the early stages of growth and should be planted in warm positions. There are many varieties and all are good garden plants.

The new *Nicotiana Sandera* and *Sandera* hybrids are fine plants, worthy of cultivation, as are the pyramidal cockscombs, especially the variety *Thompsoni*.

The Clarkias, which are Californian plants, are among the prettiest of annuals. They are robust, easy to grow, and flower for a long time. *Clarkia elegans* grows about two feet high, has an erect and bushy habit and bears long leafy racemes, varying from purple to pale red or salmon color. *Clarkia pulchella* is very gay and has many good forms. There are double varieties, but the single forms are the most pleasing. Sow the seeds out of doors early in May and give the plants a position where they are slightly shaded.

The Godetias have large blossoms which are produced very abundantly. The colors are very pleasing and the plants bloom a long time. Sow the seeds in May in a partially shaded position and thin the plants out well to give them room to grow. Then they will make nice bushy ones from one to two feet high. The best species are *grandiflora* and *amara*, but many of the varieties such as Rosamond, The Bride, Duchess of Albany and Lady Albemarle make most charming plants, besides which there are many more varieties.

The Phacelias are well worth more general cultivation. Their beautiful blue flowers are produced for quite a long time, if they are given a cool, moist position. Sow them early in the season before the weather becomes too hot. The best kinds are *campanularia*, *tanacetifolia*, *Parryi* and *Whittlavia*.

The best annual Campanulas are *macrostylis* and *Lorlei*.

Everlasting flowers contain several genera, most of them coming from Australia. They are not only showy in the garden but their flowers are useful for Winter Bouquets for which use the bloom should be cut before they are fully open, and hung up to dry with the flowers downward. The most important genera are: *Ammobium*, *Gomphrena*, *Helichrysum*, *Rhodanthe* and *Acerolinum*. When large masses of these showy plants are grown the effect produced is very imposing.

Gillias are dwarf annuals that give good results if grown in a sunny moist position. Collinsias are also charming low plants which flower most profusely if given a sunny place, with plenty of water.

The tulip poppy, *Hunnemannia fumariifolia* has large yellow flowers which are produced on long stems, making them useful for cutting. Sow the seeds early and grow in a warm sunny spot.

The butterfly flower, *Schizanthus*, has become rather popular of late years on account of its beautiful flowers which very much resemble small orchid flowers. They are grown as pot plants for conservatory or house decoration. The best kind for growing in pots is *wisetonensis*, which flowers very freely and has a good compact habit. *Schizanthus Grahamii*, *pinnatus*, *retusus*, and their varieties are very showy plants for the garden.

The annual Lupines are very attractive and easy to grow. Sow the seeds out doors in May in any kind of soil. The new *hybridus roseus* is one of the finest; it has large spikes of pink flowers and the plants grow from one and one-half to two feet high. Other kinds that are pretty and easy to grow are *Hartwegii*, *Luteus*, *mutabilis* and *pilosus*.

The Lobelias are wonderful for blue shades and we have nothing to equal them in low dwarf blue plants. The tall annual Lobelias are excellent for garden work and they all do well near the seashore.

Probably the most pleasing variety of *Nemesia strumosa* is Blue Gem. Sutton's varieties are good garden plants. It is from eight to ten inches high and its color is a most beautiful Forget-me-not blue. There are other kinds which grow taller than this variety with flowers, pale yellow, rose pink, white, crimson and scarlet.

Torenia Fournieri is a grand dwarf annual about nine inches high and covered with blue flowers. It blooms all Summer and on that account is very valuable.

Verbenas are extremely useful in the flower garden, continuing in bloom throughout the Summer. Raised from seed in February, they come into bloom in June. They can be had in almost every color except yellow.

The annual salvias are valuable plants for garden decoration. *Salvia farinacea* grows from two to three feet high and has long spikes of lavender flowers which are showy and pleasing. *Salvia Horminum*, variety Blue Beard, grows from one to two feet and has showy spikes of bright purple bracts. Pink Gem is very attractive with its large pink bracts.

Other kinds that might be added to the above are: *Amaranthus*, *Arctotis*, *Argemone* (several kinds), *Centranthus*, *Calandrinia*, *Emilia*, *Gaura*, *Kaulfussia*, *Lavatera*, *Leptosyne*, *Malope*, *Sancitalia*, *Specularia*, *Tridas*, *Viscaria*, *Erysimum*, *Perovskia*, *Gomphrena*, *Lepachys*, *Rudbeckia* and *Linum*.

Some of the annual grasses can be used with good effect in the garden and are useful among cut flowers. The following are the most common varieties grown: *Avena sterilis*, *Briza gracilis*, *Eragrostis elegans*, *Hordeum jubatum*, *Lagurus oratus* and *Pennisetum longistylum*.

(To be concluded in the June issue)

Composition of Living Things

WILLARD^N. CLUTE

IF a pile of ashes should suddenly come to life and amble down the street, the occurrence would be regarded as one of the greatest of miracles, and yet this is not far from what has happened in the case of living matter. All the materials of which this substance is composed may be found in the ordinary ash-pile. A certain amount of water and carbon dioxide and minute portions of iron, sulphur, phosphorus, calcium, magnesium, nitrogen and potassium are all that are required. These are among the commonest substances in the whole world and, by themselves, are inert, lifeless, and in no essential way different from the eighty other substances called chemical elements of which the earth itself is composed, but joined in the right way they take on life; they move, feel, think, and are thus able to control all the others.

The elements thus combined are the only ones that are known to combine to form living substance or protoplasm, but thus combined, they are endowed with new and wonderful powers. They are now able to promote the further combination of the elements, absorbing these lifeless things from their surroundings and building them up, sometimes into living matter and at others into numberless other forms which are clearly chemical compounds but which are not gifted with life and are unable to alter their own conditions. Moreover, when any of the elements in these compounds are no longer useful they may be excluded from the combinations and either thrown out or combined anew.

Most astonishing of all the qualities characteristic of protoplasm, is its immortality. The elements of which it is composed are themselves immortal in the sense that they have existed since the beginning and are no more or no less in amount than at first, but protoplasm has a new immortality in that the processes within it, which for want of a better word we call life, may go on forever. Many of the combinations built up are not and never were alive, and even some forms of protoplasm lack immortality; nevertheless, all the protoplasm now in the world has come from pre-existing protoplasm and does not arise *de novo* by new combinations of the elements of which it is composed. All life from life has ever been the rule. Though the chemist can name the elements in protoplasm and give the exact proportions of each, the wisest of his profession cannot make even the smallest globule of it.

Since there is but one living substance it follows that all living things consist of protoplasm and yet most living things are not immortal. Nearly all have a definite life-cycle which begins with youth and runs on through maturity and old age to death. Before the final scene, however, the organism hands along to a new generation bits of its own protoplasm and in this sense is immortal for it lives in its descendants. In those forms which extend their race by simply splitting in half and continue this process in endless repetition, the forms are not only immortal but comprise within themselves a part of all their ancestors. The function of reproduction may occur but once in the life-cycle, in the case of complex forms, it may occur many times though seldom occurring until the organism has reached maturity. In those forms whose race is run, that is, when the activities of combination and

re-combination have ceased, the organism gradually breaks down into its original elements and may then be re-absorbed and used in another body.

A remarkable feature of protoplasm is its wide distribution and the myriad of forms it assumes in adjusting itself to its surroundings. From pole to pole, from mountain heights to ocean depths, there are few places into which it has not penetrated. It burrows in the earth, it creeps on its surface, it invades the waters, it glides through the air, it even turns upon its own and lives within or upon many forms.

All the activities of protoplasm are connected with, and dependent upon, the storage or release of force, or energy. Some forms secure their energy by promoting the union of oxygen with other elements, but the majority snatch it from the sunlight, turning some of the rays into electric energy with which they build up combinations of carbon, hydrogen and oxygen into stable forms, that may be used when needed. There are, however, a large number of organisms which cannot obtain their energy direct from Nature but must take it as best they can from those who originally obtained it. These forms we call animals. Those which secure their energy direct we call plants. In the course of ages, many plants have become parasites like the animals and, like them, dependent upon others for energy, but all ordinarily green plants are independent. In the matter of liberating energy, however, both animals and plants are alike. By uniting oxygen with the carbon in the combinations built up, they break them down and release their energy.

It is easy to perceive that plants and animals are very much alike. Both originate from pre-existing individuals, both absorb new materials from their surroundings, both grow or increase in size, both respire or breathe, both excrete, secrete and reproduce. Both have a life cycle of youth, maturity, old age and death, and if the term of life in plants is often less definite than in animals, the end is none the less inevitable. The animals are more highly developed than the plants and have more complex organs for carrying on their activities but no essentially new activities are developed. Plants, for instance, respire exactly as animals do, but they lack the lungs, gills, spiracles and other organs by means of which animals respire.

A distinction often made between animals and plants is that animals move about and plants do not. This distinction is more seeming than real. There are numerous animals that are fixed in one place when mature, oysters and barnacles for example, while the young of plants, while still in the seed, move about as freely as animals but not by their own efforts. One noticeable difference between animals and plants is that animal tissues have a preponderance of nitrogen while the tissues of plants are largely carbonaceous. Animals have a more definite shape and size than plants and they have nerves and a brain or nerve centers while plants lack these structures. Animals feel and know, but while it is very evident that plants feel, as a whole they are not conscious of it. The most fundamental difference however is found in the fact that plants are food makers, building up simple substances into more complex molecules, while animals are food destroyers, tearing down complex substances into simpler forms.

The Care and Culture of the Philadelphus in the Garden

DR. E. BADE

THE mock oranges, sometimes known as the syringas, are used for many purposes in the garden. They show up to their best advantage when placed together with other shrubs and bushes. Here they produce beautiful effects as they droop

something green is to be kept. The larger varieties only too often become a nuisance if they are insufficiently pruned. The species of *Philadelphus* produce forms whose flowers do and do not exude a delicate odor.

These plants, which do not require any special care, do well in almost any type of soil, although they will



Philadelphus inodorus.



Philadelphus Falconeri.

over the smaller plants with their flower covered twigs. But they should be kept in a sunny place if they are to produce their flowers in all their luxuriance. When placed in a light shade they only produce their leaves and are then especially desirable for spots where

of course do better in a rich humus soil than in a dry sandy type. The subsoil should not be wet. The only care required is the removal of the old wood in the Winter. The root stock will take care that sufficient new shoots develop. When the pruning is accomp-



Philadelphus grandiflorus.



Philadelphus latifolius.

lished in the correct manner and at uniform intervals, the shrub will appear pleasing to the eye. A stock so treated as to remove the inner old wood will lighten the interior of the bush permitting air and light to enter, which will favor the formation of bud forming shoots.

The species of *Philadelphus* can all be propagated through cuttings, layers or divisions. Cuttings are made in the Spring from young mature lateral shoots, which are then placed in a somewhat shaded bed. When this method is followed in the Summer, the cuttings should be placed in the cold bed for root formation. Propagation through seeds is also permissible where the species are desired. The varieties, however, never come true to form when developed through seeds. These are sown in seed boxes in the

month of March, the soil kept moist, and the boxes shaded. At the end of May the young plants are transplanted to beds where they are further cared for.

In general it can be said that all *Philadelphus* are more hardy than is generally supposed. When placed in a somewhat protected spot, they will survive a normal Winter without injury even without Winter covering. A few species are delicate, and the roots of these should always be thoroughly covered with manure. The garden varieties which originated through the crossing of different species, such as the tiny *Philadelphus mirorophyllus* and the large flowering species, should be carefully bedded and receive a better type of soil for they are not quite so tolerant as the species themselves.

Conservation of Rare Wild Flowers

BERTHA HERBERT-HAMMOND

Picked from the stalk or pulled up from the roots
From overhead or from under foot,
Water wonders of pond or brook;
Wherever you look and whatever you find,
Leave something behind.—*Julia Horatia Ewing.*

TO thinking Nature lovers, it is a matter of grave import and keen regret to learn, that unless precautionary measures are taken to prevent the ruthless destruction and needless waste of the wealth of field and forest, many of our choicest wild flowers will soon vanish from their native haunts.

The disappearance from sections, of wildlings once found there in profusion, while accounted for in part, by the clearing of woods incident to the encroachment of civilization, is due also in no small measure, to sheer thoughtlessness or the unrestrained desire of the selfish to appropriate unearned treasures of meadow and grove.

It has been found necessary to enact laws for the protection of our song birds and other game, but the legislating of flower picking seems unappreciated, and quite likely to prove as effective as endeavoring to control satisfactorily the morals of a nation by man-made laws, cluttering up the statute books with an additional "verboten." Reparation is rather to be secured by the hearty co-operation of persons, who by a wide-spread campaign of education, or other effective means, must preach and practice the conservation of the gems of woods, wayside and marsh. Floral, and agricultural publications, the daily press, state Nature-study course, the grange and garden clubs can render inestimable service in bringing the matter of the importance of plant preservation before a public, intelligent enough to try through precept and example to teach sanity in the gathering of wild flowers, but the great hope of the future is through the school children of the land, many of whom are classed among the transgressors. The capable, comprehending teacher, through Nature study work, has a great opportunity to help stem the tide that threatens to engulf the wonders of swamp, meadow and forest, by instilling into the receptive minds of the young such knowledge as will awaken a genuine and lasting love of Nature, and the appreciation of the fact that these priceless gifts are not for present enjoyment alone, but held in trust for future generations. School children skillfully taught, when appealed to, develop into staunch allies, and trusty

guardians of the wealth of woodland. Though they are not expected to attain the high standard set by that poet of Nature, Emerson, who asks

Hast thou * * *

Loved the woodrose and left it on its stalk?

still they should, after such training, truly appreciate flowers, and know when, what kind, and how many blossoms may be gathered without harmful effect upon the flora of the vicinity. To the average child, the quality of rarity, does not add materially to the desirability of any particular flower, and many children gather, from choice, attractive flowers, like the golden buttercup, the charming ox-eyed daisy, the scintillant dandelion, dainty Queen Anne's Lace, star-like asters and other very common way-side beauties, thus satisfying their desire for flowers and at the same time conferring a favor on the farmer who justly classes these and similar sorts among troublesome "weeds." Most children assuredly feel like Lucy Larcom who said,

I like these plants that you call weeds,
Sedge, hardhack, mullein, yarrow,—
That knit their roots and sow their seeds
Where any grassy wheel track leads
Through country by-ways narrow.

It seems reasonable to believe, that children who have been educated along these lines will become intelligent Nature lovers, and will not, when they grow up, be numbered among those heedless joy-riders, "who without right or reason, despoil the woods, trespass on roadside property, carrying off as trophies of a day in the country, handfuls of drooping flowers and large branches of apple blossoms, lilacs and other flowering trees and shrubs. A movement for the protection of the harvest of the country-side, should make such depredations (now, all too common), exceptions and should subject the offenders to merited public censure and scorn.

Kind hearts are the gardens,
Kind thoughts are the roots,
Kind words are the blossoms,
Kind deeds are the fruits.

Do not look for wrong and evil,
You will find them if you do,
As you measure for your neighbor,
He will measure back to you.—*A. Cary.*

Late Tulips on May Day

FRANK B. MEYER

IT was hard this year, during the closing days of April with their cold showers, to work up enough enthusiasm to plan a long trip to displays of late tulips at the extremely early date of May 1. Nor was my mood made more pleasurable when the day dawned through dark skies from which poured down chilling rains, but so great was the lure that the journey was begun.

Little Falls (N. J.) itself is delightful, for it is made attractive by cascades and streams of water crossed by picturesque bridges. The moisture in its air and the location of the garden in rather low ground, coursed by a little canal, have made conditions quite congenial for the flowers always thought of in connection with the canals and dykes of Holland. But Mayfair has been made worth visiting by art also. The problem of making a good display of many varieties, and of having the setting and the garden as a whole pleasant without spreading the display over an area tiresome to traverse, has been very happily solved. Dotted among borders of shrubs, whose blossoms, bright green leaves, and gay flowers furnish the proper foil of color, are a number of gardens, or diminutive parks, connected by aisles and paths that lead invitingly.

The weather has been quite unkind, however, and nearly all the flowers, which, had conditions been more propitious, would have presented charming pictures, as a whole and in each little part, had to be studied through the aid of the imagination. Most of the strongest and very stalwart Darwins had bowed; some had actually succumbed. But the colors made evident the good taste displayed in devising the most effective combinations. In my coveting such a faculty, it was comforting to have Mr. Hunt assure me that if the glaring reds were removed, one could hardly err in arranging late tulips. Without the aid of contrast or combination, some varieties would appear fine anywhere and always. Gryphus, the Darwin, a handsome and brilliant dark purple-violet, tall and graceful, was one of these, even though lacking the enhancement of its colors through the sunlight on this gloomy May day, so essential to the best effects with tulips. Faust, still darker, of satiny purple-maroon, was another. Much lighter of hue, with its dusky and yet silvery lavender, was Olifant. Splendidly rich was La Tulipe Noire, even though the sun was not brightening its velvety sheen. Regal always must be Louis XIV, a breeder that with its immense size and globular form is pre-eminent in the company of the finest Darwins. It is pronounced, and fittingly, I think, "the most wonderful tulip in existence." Its dark purple flushed with bronze and broadly margined with golden bronze, causes everyone beholding it to go into ecstasies. With similar combination, but of purple much darker and almost black, is James Watt, a new aristocrat of smaller size. With more brown, of golden hue flushed with purple, of form rather loose, but stately, is Prince Albert. Charles Dickens, a dark crimson-rose, large and of egg-shape, gives in color and form an easy transition to the Cottage tulips of wider range in both form and color.

The prize would be awarded, by perhaps every judge, to Sir Harry, of lovely lavender-pink and effective yellow base and blue halo. It associates magnificently and amicably with the soft creamy yellows. But the deep golden yellow, supreme in loveliness, was found in Walter T. Ware. Zomerschoon, too, was bearing out its reputation for beautiful form, clean white with exquisitely

neat feathering of cherry-pink. But nearly as attractive, and not altogether dissimilar to this costly old beauty was Pride of Inglescombe of the type of Picotee. Other notable ones, less expensive, were *elegans alba*, The Fawn, Mrs. Moon, *Gesneriana*, *lutca pallida*, and Fairy Queen.

Among the rare and novel kinds, the one worthy of being singled out, was the "lily-flowered" tulip, Siren. I must confess that even its form was to me not altogether pleasing, while the coloring would be more satisfactory if it were clearer and not so speckled with white.

Actually the most delightful part of the exhibition to me were the oddly striped and feathered Bybloems and Bizarres of beautiful shapes, and an especially pleasing arrangement was that of a dusky quartet composed of Lady Stanley, La Victorieuse, La Duel and L'Union. Of lighter markings, in lovely violet, was Vondel, while Roi des Cerises caught my fancy, with its bright red on white blooms shaped most exquisitely.

To ride to the extreme northerly end of New York City for the Botanical Garden would have seriously tried my patience. Had I not anticipated seeing the largest and grandest massing of late-blooming tulips ever assembled on this side of the Atlantic. It required some time to take in the color and the forms of over thirty-two thousand, eight hundred blooms, representing over three hundred twenty-three varieties! Such an opportunity is rare indeed. But it is to be hoped that in spite of its not having been availed of this first time by large numbers of people, partly because of the earliness of the display and partly because of the unusual conditions of the weather, this treat will be repeated by the house of John Scheepers, Inc., New York, and the General Bulb Growers' Association of Haarlem, Holland.

The sight of the winding borders of flowers with its setting of green was alone worth coming to enjoy. Though not so artistically arranged as at Mayfair, the general effect of the large masses was thrillingly pleasant. The dullness of the day made less noticeable what might, under a bright sky have appeared to be a lack, for the large majority of the blooms were of the more pronounced colorings, the intense reds and purples, set off only occasionally by a bright mass of yellow, with the softer yellows, creams and light pinks but few. All were in perfect form for frost and wind and storm had not been so inclement as in northern New Jersey.

Most splendid of all were the dark rich purples among the Darwins—King Harold, with its ox-blood red and darker base, and Whistler of clear crimson overspread with bloom of purple tinge, very showy. Among the most striking purples was Zanzibar, a shiny maroon-black with blue and white base, and The Sultan, a comparatively small flower, remarkable because of its rich maroon-black. Zulu, an especial favorite of mine, I have never seen appearing to better advantage, while the more familiar Philippe de Commines was finer than ever, a variety that will never be supplanted; La Tulipe Noire showed the remarkably dark maroon-black without the velvety sheen usually made so brilliant by the sunlight. Andre Doria was fine in its satiny texture of petals of rich maroon. Others of the conspicuously beautiful Darwins of blood-red shade were King Harold, Eclipse and Diana; of more crimson or scarlet hue the finest were Bartigon, Farncombe Sanders, City of Haarlem, and, of

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Work for the Month in the Garden

SAMUEL GOLDING

MAY is probably the most important month in the gardener's calendar. In its early days he finds himself encumbered with work in every department. The pits and frames are overflowing with plants awaiting the advent of warmer days and nights, when they can be transferred into their final quarters in the vegetable and flower gardens with safety. This happy consummation is generally reached during the last week.

No hard or fast rule can be made regarding the exact date or time of planting out the more tender garden subjects. It is governed by the climatic conditions and the locality. We cannot hurry the seasons, and however bright and favorable the outlook appears, one is taking chances when the planting out of the more tender plants is done at too early a date, unless some provision is made for sudden falls of temperature, and there are reserves on hand in case of disaster.

Continue the succession of peas until the end of the month. This crop revels in a cool, moist atmosphere so that those sown during the earlier season give the best results, and those sown after this month are seldom a really profitable crop. It should be the aim of all growers to have green peas until the sweet corn and lima beans are ready to take their place on the table.

Where spinach is in constant demand, the New Zealand type is a fine one to raise. It is an excellent substitute for the early ones in the heat of the Summer and is a never failing source of luscious green leaves until the Fall. The seed should be sown this month when the ground is warm.

Sow more beets, and carrots to be used as soon as they are large enough, and string beans for succession. Sow Cos or Romaine lettuce, which stands the heat better than the cabbage lettuce type; also endive and chicory, which is invaluable for winter salads. It pays to give generous treatment in order to have fine roots for lifting in the Fall. Sow in rows about fifteen inches apart and thin out to six in the row, for it requires the same treatment as parsnips.

Prepare for sowing melons, cucumbers, and squash outside by making hills about six to eight feet apart, incorporating some good manure. When conditions permit, sow about twelve seeds to the hill and cover to the depth of half an inch.

Early sweet corn, lush lima beans, okra, and gumbo should be sown. Plant out those raised in pots. Tomatoes can also be planted out but egg plants and peppers need warm nights before they are placed outdoors.

Attend to the early thinning of crops for it is most important that this is done as soon as the seedlings are large enough to handle. They soon become weak and drawn if left in too close contact for any length of time. In the case of early carrots or beets, it is not necessary to thin severely as they are soon fit for use.

Plant Brussels sprouts in fairly rich soil. They well repay any energy expended on them, as in the early Winter months sprouts are greatly appreciated when other green vegetables are scarce.

Transplant the late batch of celery so that it can be moved with balls of earth when planted into its final quarters. This helps to withstand the move, especially if hot sunny days prevail at the time.

Earth up potatoes as soon as the tops are sufficiently large. A sharp look-out should be kept for the potato bug which will make its appearance on sunny days. Spray at once with Paris green.

Mulch the strawberry bed with clean straw to prevent damage of the fruit during heavy rains and contact with the soil.

The asparagus bed should be cut over daily with care. Do not leave the weak and inferior growths as they tend to exhaust the crowns. Give the beds a dressing of super phosphate or of some approved fertilizer. Common salt is generally used as a dressing for it destroys the weeds, but there are many who consider it a questionable practice, especially on the heavier soils.

Cultivate between the growing crops to keep down weeds and to conserve moisture. This operation must be continued throughout the entire growing season.

There is every indication at the time of writing that May will open with a veritable blaze of color in the flower garden. The severe weather experienced at the end of March blasted the hopes of many of the early tulip enthusiasts, whose gardens were exposed to the bitter winds which then prevailed. Such plants as *Delphinium* and *Diclytra spectabilis*, which were growing apace, were severely damaged. The gardens in sheltered or favored districts have been bright throughout all April with flowers, many of which bloom in early May during most seasons.

The pink and white *Phlox subulata*, the white rock cress, *Arabis albidia*; the yellow of the rock madwort, *Alyssum saxatile*; the blues of the Virginian cowslip, *Mercurialis Virginica*; Bethlehem sage, *Pulmonaria saccharata*; the various anemones; fritillarias; squills or scillas; the bright colors of the tulips, hyacinths, and the various types of *Narcissi*, with the multi-colored pansies are among the most common of the April gems. They tend to increase the interest and make us look forward with pleasant anticipation to greater delights in May.

The Darwin and Breeder tulips supply the chief features of the early days, and when the shades are well blended, present a picture hard to surpass. It is a good plan at the time of blooming to take note of jarring colors, errors of planting, and ideas which would perfect the garden scheme next Spring, that we can refresh our memories when planning next Fall's planting.

The pæony, probably one of the finest and most showy flowers in the garden, is full of promise and each successive season sees something worth while added to the already long list of wonderful flowers we know. These plants should be disbudded early, and this remark applies as well to the *Iris*, whose admirers are legion. To the enthusiast the garden is a place of enchantment, each variety appearing more fascinating than the other. We begin in April with the dwarf species, *Iris biflora*, *I. pumila*, *I. cristata*, with the German iris in May, culminating with the noble *I. Kaempferi* at the end of June.

Do not be tempted by the bright warm weather early in the month to commence planting out the summer bedding, for these are often delicate plants, susceptible to light frosts and wet, cold weather. Many of the hardier annuals can be set into their flowering quarters, such as

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Spring Flowering Phloxes

RICHARD ROTHE

I AM well aware of the climatic advantage of the north in regard to mid-Summer effects of flowering hardy perennials. For Spring and Fall, however, conditions are more favorable in Middle Atlantic and Central States. Close observation as time passes shows



Phlox subulata rosea

a keener realization of the splendid opportunities for the future. The steadily increasing demand for Spring-flowering Phloxes is one evidence. As a mere ground covering on dry, sunny slopes they prove wellnigh indispensable. The most convincing demonstration of the ornamental value of this low and dense growing and creeping type of plants are the vernal sheets of color in snowy white, light and dark pink, various shades of lavender, carmine, and magenta red, produced by the blossoms of *Phlox subulata*, *amena*, and *ovata carolina*



Phlox ovata carolina

when we see them in reality. For climatic reasons, deprived of the enjoyment of the wonderful arrays of the blossoms produced by the mossy Saxifragas and a host of

other beautiful strictly Alpine plant species, it is chiefly by means of a free employment of our own native mountain Phloxes that we are able to maintain a vernal color gayety in our rock gardens approaching in richness the European aspects. Reliable to endure the hot mid-Summer month without harm, they very rarely suffer under a light covering in Winter. This covering is most essential in March, when the soil under a thick mass of creeping growth remains in a solid frozen state while the warm sunrays disastrously urge vegetation and root-action. Of the garden varieties of *Phlox subulata*, I mention *alba* and *Nelsoni* as the best white; *lilacina* flowers pale lilac; the blossoms of *Bridesmaid* are white, purplish tinted; those of *atropurpurea* purplish rose, while *subulata rosea* is covered by a mantle of bright pink hue.

Phlox amena, a species seven to eight inches high can be used for Spring bedding or for edging purposes on perennial borders. In the rockery its masses of vivid carmine pink flowers attract attention at a glance. Leading in general popularity, however, is *Phlox divaricata canadensis*. Its swaying masses of pure, pale blue panicles are today a feature of nearly every garden. The color of the



Phlox divaricata canadensis

flowers of the variety *divaricata Laphami* is a trifle darker in shade. Less known but well worth its space is *Phlox ovata carolina* a species producing purplish pink flowers on stems nearly a foot high. Closing my notes I wish to call attention to *Phlox pilosa*, one of the most useful varieties for grouping as well as for rock garden planting. In bright sunlight its masses of clear rosy lavender flowers borne on stems from twelve to sixteen inches are extraordinarily effective.

All the taller growing varieties mentioned should be cut back after flowering to insure a strong bushy growth near the rootstock and a green appearance throughout the later part of the season. The creeping *subulata* type rarely needs any cutting back at all. Spring-flowering phloxes prefer a light loamy soil of sufficient moisture retaining humus. Propagating is done by division or cuttings in mid-Summer. As a rule seed production is not very abundant and for this reason seeds are rarely obtainable.

Our Garden of Annual Flowers

FLORUM AMATOR

WE are going to tell you what we grew in our 1920 garden of annual flowers. If you have not been in the habit of cultivating annual flowers, you should do so, if possible this season. From the tenth of May until the tenth of June is the most favorable time for planting the smaller seeds in the open garden. A much larger percentage of the smaller seed will germinate, if planted in the garden during this period, than if planted in April. When a hotbed or conservatory is available the seeds of all kinds of flowers which endure transplanting—a few will not—may be sown in seed pans or flats in April and in mid-May transplanted into the garden beds. If we have not such facilities, we need not be at all discouraged, but sow our seeds in the garden beds where they are to grow, and if we follow out this method with care and ordinary intelligence we will obtain satisfactory results with less work—though we will need more seeds of each kind—than by sowing the seeds under glass and transplanting.

We hardly need tell you that we planted sweet peas, the shape and colors, and fragrance of whose beautiful flowers are all so pleasing, and that we planted these as early as we could work the ground. For our sweet peas we chose a place away from our beds of annuals, where the soil was inclined to be moist but not wet and soggy, as the drainage was good, in the Autumn of 1919, and in that season made preparation for sowing our sweet peas the next Spring in the following manner: A trench extending north and south was dug about two feet deep and 100 feet long—we live on a farm where 100 feet does not count for much. In the bottom of this trench we placed vegetable refuse, that is the cleanings of the vegetable and flower gardens for the previous season, in such quantities that when it was stamped down hard, the trench was one-half or more full; above this was placed stable manure in such volume that after the manure was packed firmly the trench was three-fourths or more full. In the digging of the trench the richer top soil was thrown out on one side and the rest of the soil to the other side of the trench. Enough of the richer top soil was placed above the manure to make the trench rounding full. The rest of the soil was thrown over the adjacent surface of the garden. Some years we do not prepare our sweet pea trench until early in the Spring of the planting season, instead of in the previous Autumn, but we prefer Autumn preparation. In early Spring we found the refuse and manure in our Autumn prepared trench had settled until the trench was no longer full, and after raking into the soil of the trench a very generous spread of pure "rose bone" flour, we put back enough more of the top soil, which we had saved, to make the trench rounding full. Next the garden line was set and a drill made about two inches deep. In this the seeds of the choicest Spencer type in about ten separate colors were sown quite thickly so as to be sure of a good stand of plants from the first sowing. The seeds before they were covered were pressed in firmly with the blade of a "draw" hoe, then covered with about two inches of soil and after this soil was made firm with the hoe, a little more soil was thrown over the seeds and left loose. When the plants were about two inches high a generous spread of wood ashes was applied each side of the row of plants and raked in. The plants were thinned to stand about four inches apart. Soon after we set firmly white birch brush about six feet high rather

close together on the west side of the row a few inches away from the plants and brush about eighteen inches high on the east side slanting a little toward the plants so as to force the vines to climb the higher brush. After the vines were well up the brush, we dug a V-shaped trench about a foot away from plants on each side of the row, and threw the soil from there up towards but not so close as to reach the row of plants. This operation made three V-shaped trenches, one in which the row of plants stood and one each side of the row. Each of these trenches, whenever the rain fell, caught the water and carried it down to the roots of the plants. The result of this method of culture was an abundance of flowers during the usual season of sweet peas.

Our cosmos also was planted away from our bed of smaller annuals. We planted seeds of Lady Lenox pink and also white and a crimson variety called *conchita* in a flat (shallow box) in early April and set the flat in a hot bed. When the plants had their character leaves, we set the flat outside in a sunny protected place to make the plants grow stocky and hardy. In early May we set out a row of fifty plants, eighteen inches apart, and when a foot high we set a strong cedar bean pole to each plant and tied the plant to the pole with soft string. As the plants grew taller, we tied them twice more. Beginning about the time of early frost and extending well into cold weather the Lady Lenox both pink and white, gave thousands of blooms; the crimson variety, *conchita*, began blooming about three weeks earlier than the Lady Lenox, but was not quite so free a bloomer, nor were the flowers as large.

Our bed of the smaller annuals was about 75 feet long and four feet wide with a path about two feet wide on each side. Here we sowed the flower seeds of several kinds in late May and early June in shallow drills about eight inches apart.

At this distance we were able to cultivate between the rows of plants with a narrow bladed hoe and rake. After the plants were a few inches high we thinned them to stand from three to six inches apart according to their kind.

Of *Calendula*, said to be the marigold of Shakespeare, also called Pot Marigold and Broth Marigold, whose flowers Charles Lamb speaks of in no very affectionate way in his Essays to Elia, as floating around in his stew, we planted chiefly the varieties Orange King, Prince of Orange, Meteor, Nankeen, and Sulphur Crown, and a packet of mixed seed. We never can resist after choosing our favorite varieties of each kind of flower, buying a packet of "mixed seeds" or in seedsmen's parlance "finest mixed" just to see what we will get. We began cutting flowers from our *Calendula* in August and continued to cut, for *Calendula* is a hardy annual, clear into November.

Next to our *Calendulas* we planted African marigolds, mostly the deep yellows, Prince of Orange, Pride of the Garden, and Eldorado, but some lemon-yellow too, Lemon Queen, and Delight of the Garden. We like the stimulating fragrance of the marigold blooms. They are not a graceful flower, but their form is unique, the color of the deep yellow flowers rich, and they withstand the early frosts well.

There would to us, be something lacking in our garden of annuals without the pretty little French marigolds, both the single and the double, the yellow, the brown and

the yellow variety marked with red, known as Legion of Honor. We like to wear one of these on our lapel as we go to business.

We planted *Calliopsis* or *Coreopsis*, call it which you please, but we are not going to plant it this year; we used to think it pretty, but somehow we do not care for it any more.

Mignonette, of course, we planted, you will never be taken into the florists' church or go to the florists' heaven if you do not plant mignonette in your garden of annuals, and tell in superlatives how you love it. We care little for the giant varieties without any fragrance; mignonette without fragrance is like "The play of Hamlet with Hamlet left out," therefore we plant Machette, a dwarf variety, very fragrant, and Allen's Defiance which is a rather large variety as well as deliciously fragrant. This also lasts well into the Autumn. Right here we will say that in making a selection for our garden of annual flowers, we choose chiefly those which are hardy and bloom well into the Autumn.

In asters there are so many attractive types and colors that in choosing what to plant one cannot easily miss getting something fine. These are some of the types: Crego; Comet; Ostrich Plume; all of which are somewhat irregular in their build and whose effect is delightfully soft and pleasing; Invincible, a good type; King, too stiff and formal to please our taste; several varieties, which are known as American Asters, namely, American Beauty, Autumn Glory, Pink Enchantress, Peach Blossom, Lavender Gem and others, a magnificent strain; besides these there is the later flowering "Giant Branching" strain, and the good old Truffaut's Peony-Flowered Perfection, and Victoria from which apparently so many of the more recent types which we have mentioned have sprung. We do not plant "Extra Early Asters" though they are pretty; we prefer the mid-season and late. Our asters give us our best cut flowers in a wide range of colors and shades, some strong, some delicate, and some medium, asters, too, bloom well into the cool days of Autumn.

We plant several kinds of "Everlastings." We are a little old-fashioned; we like to have in our house winter bouquets of *Helichrysums* (Strawflowers), the prettiest in color and in form and the most lasting of all the everlastings; *Lunaria* (Honesty) for its silvery seed pouches; *Gomphrena* (Globe Amaranth; also called Bachelor's Buttons); *Acroclinium*; *Rhodanthe*, the most delicate and refined of all the everlastings; *Xeranthemums*; *Physalis Francheti* (Chinese Lantern Plant) for its gay-colored fruit husks. We gather all of the flowers when in the bud, tie them in bunches and hang them in a dry shady place to cure.

The plumed type of *Celosia* is the only one for which we care; of this we plant two strains, Thompson's *magnifica*, and Castle Gould; when we get seeds gathered from flowers representing the highest type of those strains, as we have sometimes, we like our celosias, but when we get just mediocre seeds, as we did last season, we do not care for celosia. Next to the plumed type we like that new unique form named "Chinese Wool Flower."

For blue flowers we plant the annual larkspurs and find them highly satisfactory; we do not care so much for the pink and white varieties though they are pretty, and we plant a few of these, but mostly the shades of blue. This too is a hardy annual.

Zinnias, we plant largely, though they succumb to the early frosts. We plant all colors, but like best the crimson, the scarlet, the orange, the Salmon pink and flesh shades of color. The long stems on which Zinnia blooms are carried make them a good flower for cutting.

Zinnia blooms, when you look at the blooms alone, are pleasing to the eye, but when we observe them in connection with their stiff stems, we cannot by any stretch of imagination call them a graceful flower.

Scabiosa (Mourning Bride, Pincushion Flower, Scabious) is an excellent cut flower. In fact we usually cultivate only those plants whose flowers are good for cutting. We do not under value the pretty little flowers (indeed we almost love them) which can be used in edging beds and borders or for the body of beds, where a flat effect is desired, the dwarf Sweet Alyssum and Ageratums and Lobelias, and Portulacas and Forget-me-nots. Had we time to plant annuals for design effect, we would use all these little gems of the flower kingdom. The name Mourning Bride, given to *Scabiosa*, reminds me that when I was a small boy and helped my Mother in her flower garden, she cultivated Mourning Brides, and that all of the blooms were a black-purple color. Perhaps that was why the name Mourning Bride was then given to the flower. We plant just for "Auld Lang Syne" a few of the black-purple color, but largely the beautiful flesh color, and lavender and scarlet varieties of this very satisfactory, hardy annual. Our experience teaches us that we should plant scabiosa seed in the open garden, if we cannot start it in a flat in a hot bed, and transplant outside when frosts are over, a little earlier than the seeds of other flowers as it seems to need a long season to give us a full crop of flowers.

The delicious fragrance of the flowers of the several types of Stocks would lead us to plant these even if their flowers were not beautiful. The beauty and fragrance of their flowers combined, and their vigorous habit of growth makes Stocks to us among the most desirable of annuals. To have these in bloom early, we must plant the seeds in March in flats or seed pans and place these under glass, and when the plants are large enough transplant these into other flats and later after frosts are over into the open garden. We find, however, that planting the seeds about May 10 to 15 in the open garden that we have Stocks blooming freely in the cool days of Autumn. We plant all types, but chiefly the Dresden Perpetual or Branching and Ten Weeks.

At the end of our bed of annuals where the soil was poorest we sowed broadcast poppy seeds of several kinds, but the Shirley seemed to be the only kind to germinate. From these we plucked many lovely delicate blooms throughout the Autumn. We were really amazed to see how these seemingly tender plants, and delicate flowers withstood the cold of the November nights. We picked our last bouquet of dainty blooms from our Shirley Poppies on Friday, November 19. The plants were the very last to succumb to the severe frosts of late November.

LATE TULIPS ON MAY DAY

(Continued from page 575)

course, Pride of Haarlem, with Ouida, however, by no means outclassed. How poor a day it was for the light shades was illustrated by Gretchen, which appeared quite faded and washed out; but Clara Butt was attractive and in every way as lovely as ever.

Among the Cottage tulips the yellows of richer shades were pleasing. The crowning masterpiece was found among the Breeders. No more splendid flower do I expect ever to see than the group of one hundred fine blooms of Louis XIV, the Breeder tulip which at Mayfair, too, represented the acme of loveliness among tulips.

Character is made up of small duties faithfully performed, of self-denials, of self-sacrifices, of kindly acts of love and duty.—*Selected*.



A Specimen Plant of Herbaceous Calceolaria

HERBACEOUS CALCEOLARIA WILLIAM REOCH

THIS *Calceolaria* deserves more attention than it receives, and as a pot plant, either for exhibition or conservatory purposes, no other Spring flowering plant is more admired.

month of May, but this year our plants were in flower in April.

The specimen illustrated is three and a half feet through, and I have no doubt that much larger plants than this could be grown within the time specified above.

For large specimens, sow the seed in May; transplant the seedlings carefully into flats and keep them in a shady corner of the greenhouse. Use a very open compost when potting. Leaf mold, turfy sod well broken up, old cow manure, sharp sand, and some fern root which the *calceolarias* like, make a good compost.

The plants will wilt a little during the hot months even though shaded. This wilting hardens the plants and side growths soon appear, and then, the bushy habit is accomplished. In the final shift, pot firmly, keeping the plants as near the glass as possible and in a position where they can get air, but are away from cold draughts. The final shift could be made before November 15. Winter the plants in a cool house, though I have found the carnation temperature quite suitable. Older growers recommend a more cool treatment, but if the greenhouse is kept moist, a higher temperature does no harm. As flower stems appear, encourage them with liquid manure. The flowering season is usually the

May Birds

PAUL B. RIIS

WHAT splendid opportunities are given us this month to judge comparative values in bird song.

The mating instinct is giving fullest expression in varied song and chorus to those which remain with us to build. Yet in the fulness of melody one regrets missing the elusive strains of many incomparable songsters, attaining their highest perfection of song in the solitude of the northwood, the lakes and barren regions beyond. Their wild lyric music is rendered to the rhythm of lapping waters and the swaying of fragrant balsams, giving voice to the spirit of the wilderness. To hear them for a fleeting moment appears like trespass into a sanctuary. Priceless are the memories of the wild grandeur of frowning mountain range, solemn and inaccessible with the dense growth of balsam and spruce, the countless lakes and woodland streams articulated by precious notes of hermit thrush, winter wren or ruby-crowned kinglet. The kinglet, friendly to the point of recklessness, its postnuptial song a rollicking roundelay, in its transient stay here is pouring out its joy of life with an assurance and fineness commanding instant attention. The jubilant notes are sweet with refreshing fragrance of balsam and spruce fully attuned for the silence of vast forests. The white-throated sparrow, attaining the sweet fulness of its refrain in the meadow lands of its northern breeding grounds, is a more lavish performer than other transients. The white-crowned and Lincoln sparrows both possess fine voices, but are seldom heard here. Once only were we permitted to listen to the exquisite strain of the hermit thrush in this latitude and yet the sweet modulation lacked the mellowing woodland canopy of towering hemlock and maple.

There are still others worthy of more than passing interest, arrivals of early May, the scarlet tanager with his cheery carol, the rose-breasted grosbeak—the clear-voiced songster of woodland and door-yard. The cat-bird, the charming entertainer, also an early arrival of the month, is closely followed by the aristocratic wood-thrush, a performer of the highest order. Its clear, flute-like notes lend an indescribable charm to the billowy depth of any woodland. The warbler's too, passing through in great numbers, are indulging in fitful snatches of merry song, but attract our attention far more on account of their exquisite coloring. The orioles also help to swell the chorus, but the migration reaches its zenith when the note of the bobolink gladdens the vernal meadows. Its irrepressible, jubilant song, borne across the radiant grass lands, mock the toil of long journeys from distant lands.

The appended list is taken from the author's observations during May. In making due allowance for difference in latitude and season, it will be found a comparatively safe guide to the movements of the birds.

May 1	Lesser Scaup Duck
Chimney Swift	Blue-winged Teal
Palm Warbler	Yellow-leg
Black and White Warbler	May 3
Louisiana Water Thrush	Oven Bird
Lincoln Sparrow	May 4
Lecomte Sparrow	Wilson Warbler
Whip-poor-will.	Yellow-throated Vireo
May 2	Blue-headed Vireo
Baltimore Oriole	Pine Warbler
Osprey	Orange-crowned Warbler
Ruddy Duck	

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Some Neglected Native Trees

HERBERT DURAND

THERE are a number of native American trees which ought to be more widely used, particularly in naturalistic plantings. During the past twenty years, leading nurserymen have been giving greater attention to some of the native trees, but they have neglected many of the most useful and beautiful. Among those which have either been entirely ignored, or are only offered by a few growers, are the following:

The Scarlet Maple (*Acer rubrum*) is specially meritorious. It is of sturdy habit and symmetrical proportions, and while usually found growing naturally in swampy ground, will thrive in any well drained locality. This tree is conspicuously scarlet all the year. Its scarlet flowers appear in early Spring and are followed by scarlet fruit. Its foliage in Autumn is brilliant scarlet and yellow, and even in Winter, the scarlet of its twigs, offers a striking note in the landscape. It is particularly fine for planting along the banks of streams and on the borders of lakes and ponds.

The Striped Maple (*Acer pennsylvanicum*) is usually a tall shrub with a good habit of growth, though it sometimes develops into a handsome small tree. The coloring of its abundant fruit in Autumn is very bright and interesting. It does well in partial shade and is especially adapted for planting on sloping banks, wherever a rapidly growing shrub or tree of moderate size is needed.

The Shad Bush (*Amelanchier canadensis*) is thoroughly good in all its forms. Its masses of snowy flowers in early May, at the time the shad are running, give it its common name. The fruit (known as the Service Berry) is good to eat and the foliage is handsome during the entire growing season. The Shad Bush varies widely in size and form—some varieties being low shrubs, while others, when well grown, make sturdy symmetrical trees, in some cases as much as forty feet in height.

The Canoe Birch (*Betula alba*) does not develop its pure white bark until the tree has reached a height of 12 or 15 ft., but when this silvery bark comes it stays and, together with the airy head, gives it an unusual beauty. It is a long-lived tree. Other excellent native birches are the Yellow Birch (*Betula lutea*) a sturdy, broad headed tree with lustrous golden bark; the Black Birch (*Betula lenta*) with fragrant bark and clear, green foliage; the Red Birch (*Betula nigra*) with richly colored bark, and the Gray Birch (*Betula populifolia*), which has ash-gray bark and grows in clumps of from three to ten stems, in poor soil—all of these trees are of singular grace and beauty, and are well adapted for use in landscape work.

The Red Bud (*Cercis canadensis*) and the white and pink Flowering Dogwoods (*Cornus florida*) are generally in cultivation, and are mentioned here because of their unequalled fitness for planting among larger trees, in open spaces or on the borders of woodlands.

The Yellow Wood (*Cladrastis lutea*), while a southern tree, is perfectly hardy in the latitude of New York, and is one of the very best trees of medium size, combining symmetrical growth, beautiful foliage and handsome flowers. It is specially good used as a single, isolated specimen.

The American Hawthorns (*Crataegus*), of which Gray lists 67 distinct varieties, are all beautiful in flower, fruit, foliage and form. Only four or five native Thorns are offered by nurserymen—*Cordata*, *Coccineum*, *Crus-galli*,

Mollis and *Tomentosa*; any of them, however, will prove to be admirable trees, used either in masses or as specimens. They will make impenetrable thickets when needed and are much better for hedges than the English Hawthorn. Thorns under four or five feet in height transplant readily and can be moved from their natural habitats in pastures and on hillsides with little difficulty.

The American Wild Crab Apple (*Pyrus coronarius*) is not only pretty nearly the best of all the flowering apples, but has two distinctive characteristics which add to its desirability. One is its flowering season, which is from ten days to two weeks later than that of other apples and the other is the exquisite perfume of its flowers.

The Sassafras (*S. variifolium*) is one of the most attractive of our American trees, particularly in Autumn, when its unique foliage is glorious with pinks, yellows, greens, and opalescent tints. It is not a difficult tree to transplant or to grow, and while found naturally in poor soil, it responds quickly to good soil and good treatment, soon developing a pleasing form, with a well proportioned head and a general neat appearance which makes it highly desirable.

It is a common mistake to treat native trees carelessly, just because they are native. They are entitled to, and should be given the same care and attention that is considered imperative when some high-priced novelty from overseas is being planted. Success depends in great measure on giving them around the roots, plenty of rich, black loam; of setting them firmly in the ground; and mulching for the first year, at any rate, with well-rotted barnyard manure. They should also be kept thoroughly watered, particularly during the hot Summer weather. Thus treated, the newly set trees will be carried safely through the first few years, after which the growth will be more rapid and they will soon produce desirable and satisfactory specimens.

WORK FOR THE MONTH IN THE GARDEN

(Continued from page 576)

Larkspur, Cosmos, *Antirrhinum*, etc. Continue to plant batches of *Gladioli* for succession, and the cannas and dahlias. Some expert dahlia growers advise that the planting of dahlias should be deferred until June, producing marvellous blooms as evidence of this course, but, no doubt, locality plays an essential part in the question of May or June planting.

Sow the seeds of biennials, including *Digitalis*, fox-gloves, Sweet William, and Canterbury Bells for next year's blooming; also the seeds of herbaceous plants that will be large enough to transfer to the herbaceous border in the Fall.

The sweet peas should be well staked, or if wire netting is used, they should be tied at frequent intervals. Plants in the borders will also need support, and should be neatly staked. Slovenly staking detracts much from the charm of the flower garden, so one must carefully endeavor to make the stakes as inconspicuous to the eye as possible.

Cut back shrubs as they pass out of bloom. Finish up any planting of evergreens that has to be done, and watch that the newly planted shrubs and trees do not suffer from drought.

The Greenhouse, Month to Month

W. R. FOWKES

MAY and June are important periods, for many exacting operations must be executed in order that the greenhouses may be beautiful next Winter, and it is necessary to know what will be needed to furnish the conservatory and home next Fall.

Chrysanthemums must be given their final shift. If grown in pots the 'mums can be put anywhere one wishes. If grown in the bench, they make a showing but are not as useful in the small place as if grown in pots. Nine inch pots are as large as is necessary for specimen blooms of the largest kinds that were propagated early, but eight inch pots will do for most varieties, and take less space. The soil is the most important subject now that the plants have to go in their blooming pots. Fibrous loam, chopped roughly with the fine left out is necessary; one part well rotted cow manure; leaf mould, if the soil is of a clay nature, mortar rubble to sweeten, to which the roots cling; best quality bone meal, a six inch pot full to a wheelbarrow load of soil, will make a good compost. Good soil is essential, being the daily bread, and if one cannot obtain the best, then the best results cannot be attained. Water each plant well before repotting. This is important to the amateur. The expert knows well the disastrous work of yellow flagging leaves after the careful soil preparation, due to the dry balls of earth, which the water going through the new soil will not reach, and no doubt many anxious questions will be addressed to experts about the new 'mum disease. Put a few crocks in the pot with rough pieces of soil, firmly rammed. Next, place the plant in the centre, and then the compost, which should be in a semi-dry state, must be pressed down very firmly, leaving two inches at the top for water and topdressing. Now place them in a cool house in full sunlight, and do not water for two days; ventilate thoroughly and spray lightly, but see that they are dry at night. Some varieties need less spraying and will lose their leaves if excessively sprayed, and these should be separated from the others.

That noble variety, Corporal J. Fred Piper dislikes too much on its crown. Nagirroc is another, and the potting system is advantageous to them. If the plants are dusted every week with Grape Dust, fungus will not appear.

Carnation planting should be in progress and the arch disease, stemrot, will make its way if care is not exercised in planting deeply; also do not allow the plants to be blown about by every wind. To prevent this, it is advisable to tie each plant to a short wire stake, and then stemrot will not have as good a start. Use lime in the soil also.

The Begonias from leaf cuttings of the Lorraine type should be placed in baskets lined with moss and light soil; set about twenty-four of the rooted cuttings through the sides and bottom of the basket, and you will have a perfect ball of flowers next Christmas. Patten and Mrs. Peterson should be in four-inch pots in cool frames.

Sow the *Cineraria* hybrids in a pan and place in a cool frame. This is the earliest batch.

Many of the palms and decorative plants will be placed outdoors, and more room will be at hand for many of the young plants.

The poinsettias that have rested can be repotted. Use a little bone in the soil for these cut back plants, and start them on the dry side.

Some of the orchids can go into a cool frame in a shady place which will be of advantage to the plants. *Cypripediums* of the *insigne* type, *Calogyne cristata* can go out. The June orchid, *Cattleya Gaskelliana*, is sending out its blooms, not as lovely as some of the tribe, but indispensable for the June weddings. *Miltonia vexillaria*, the pansy orchid, is now in flower, and is a good keeper.

Orchids are not difficult to grow as is generally believed. If kept clean with sponging once a month, and if from now on they are given free air and shaded from the burning sunlight, they will be a rare pleasure to the beholder.

Feed the peaches with a top dressing of loam, mortar rubble and Thompson's Vine Manure, and as the plants develop and the fruits commence to color, put them in a cooler place. More air is necessary for the development of the fruit. Spread nets underneath the plants to catch any fruit dropping in the night.

Rose planting should be in order now. Do not fail to grow the pink Dunlop if you need a good, cool-loving kind. It will give more flowers to the plant than any rose grown, and many commercial men of note are extending the planting of it. I counted sixty blooms and buds on individual plants in the Totty greenhouses last month. The Dunlop is wonderful as grown in that establishment with a low night temperature.

Tuberoses that were started should now be in five-inch pots and kept warm and well syringed. Their fragrance is always acceptable.

Give the *Celosias* and *Clarkias* their last potting. Use dried horse manure for the final shift in light soil, and *Streptocarpus* and *Gloxinias* from later started bulbs can be potted and they will give a succession of bloom all Summer. *Bouvardias* need not be grown in larger than five-inch pots if fed with Clay's. *Gardenias* to bloom perpetually must have light top dressings of Ichthemic Guano and leafy soil every ten days, just a little, but often.

Boronias, *Chorizemas* and *Ericas* should be outdoors plunged in ashes, care being taken with the watering. Rain is sometimes deceptive in this respect, some plants being water-logged and others dry.

Azaleas that have blossomed should be well syringed and placed in a semi-shaded spot outdoors, and the drainage attended to. Angle worms, the pests of these plants are disastrous. Spray all well with soot water, which is a fine fungicide.

The *Camellias* will delight also with soot water. Mix a little with some strong loam, and topdress where the water has washed the soil from the roots. The *Camellia* has its buds already formed for next year's blooming, and any stimulant used must not be too forcible or you will lose the buds.

Topdress the cucumbers in the house with a rich mixture and cut off any worn out laterals, and brown leaves. Burnett's North Pole is the best I have grown this time of the year. It will stand the sun better than Telegraph. They must be tied regularly and pinch one joint past the fruits. Do not over crop; rub off half that appear and do not have the plants dry, or bitter flavor will result and red spider will make its appearance. A damp place and not too much air are what cucumbers enjoy.

A Lesson on the Plant In Relation To Its Food

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

THE great fundamental in plant production is growth, therefore a proper conception of it is of the utmost importance, and all matters connected with a plant's environment are good or bad, as they facilitate or retard growth.

Growth is the normal, permanent change in the form of a living vegetable or animal body, and is usually accompanied by increase in size. It may occur either through expansion of cells already formed, or through cell multiplication. The latter may take place either by division of older cells into two or more smaller cells, or by the formation of new cells within older ones—the young cells thus formed attaining full size by subsequent enlargement. No growth in a plant or in an animal can take place except by the enlargement or multiplication of cells, or a combination of both.

Practically, the increase in growth is the yield the plant gives whether by the mere increase in size of the plant itself, or in the fruit or seed it produces. Necessarily, growth receives consideration in all studies connected with every phase of plant life, for it enters into any discussion of the relation of the plant to its environment; to the making, use, and accumulation of food materials; and also to reproduction.

Obviously no growth can take place without the use of material; suitable material we class as food, while unsuitable material becomes, if imbibed, sometimes absolute poison; and the want of matter agreeable to the plant, or the existence of matter disagreeable to it, may not only decrease growth, but stop it altogether, and, if long continued, death may result.

There are many internal and external factors by which growth is conditioned. Among the former must be assumed that inexplicable, invisible factor known as vitality, which is the attribute of a living individual. The external factors are many, the most essential being moisture, a suitable range of temperature, oxygen, and the presence of several nutrients and crude food materials. Taken as a whole, there are many important relations between continuous growth and certain external factors; and most plants exhibit such complex relations as to render the problem extremely difficult, and which call attention in a very emphatic manner to the many intricate points connected with the art of plant growing. For instance, conditions causing extreme luxuriance of growth are more or less inimical to a large production of flowers, fruit or seed. Again, when potatoes, for example, grow an excessive amount of haulm, tubers are generally sparingly produced.

Of course, growth can only go on as the result of the intake and assimilation of food, which growth in the case of the embryo starting into life when seed germinates, is brought about by the use of the highly concentrated food stored in the seed by the parent plant. Taking all the plant-food constituents as a whole, excessive food supply is not the extreme we have most to fear, since soils are rarely excessively fertile, and in the ordinary sense over-manuring is not a fault very prevalent in gardening, and indeed in any case practically all of the plant-food constituents may be present in excess without doing material harm. Harm, however, may result if any one constituent is present in an available form greatly in excess of the others, and this is especially the case with respect to nitrogen. An excessive quantity of any form of available nitrogen, such as nitrate of soda, or easily available, such as sulphate or ammonia, stimulate growth at the expense of flowers, seed and fruit. In crops grown for the latter parts, available nitrogen must be used with caution. Apple, pear and quince trees liberally manured with such fertilizer produce an excessive, over-succulent growth of wood, which is subject to blight and Winter injury, and forms few, if any, fruit-buds. Grain under similar conditions forms long, weak straw, with poorly filled heads. Grapes grown upon over-manured ground produce excessive amount of vine, with few and late ripening bunches. For plants occupying the ground permanently, such as fruit trees, grape vines, roses and the like, it is necessary to add nitrogen to the soil in a direct form because, unlike ground devoted to annual crops, there are no other means of supplying it. To this end ground bones are an excellent and safe plant-food, as the nitrogen becomes available by degrees. In addition to nitrogen, bones supply phosphoric acid, and by using a little lime with them, soil potash is liberated. For grapes, bones from the family table may be saved, roughly broken with a hammer and buried near the roots of the vines.

There is less danger of over-feeding crops grown for parts other than flowers, fruits, or seed, especially if decomposed stable manure is used, and with crops like lettuce, cabbage and cauliflower, available nitrogen is useful if used with discretion, but this and all other high grade, concentrated and compound mineral fertilizers will kill plants if used to excess. The more easily any fertilizer becomes available the more likely will harm result from a large application at one time. In the case of nitrate of soda, for example, this is readily dissolved by soil-moisture, is at once available as plant-food and the plant takes it up immediately in the water absorbed by its roots; therefore, the plant would, as the result of a large quantity of nitrate being supplied, be unable to prevent an excess of nitrogen being carried into its system. Exactly how harm or death results from this is not definitely known. There are several possible reasons, but probably the most important factor is that the necessary balance between the various food ingredients is upset to a degree which disorganizes entirely the assimilating powers of the plant, and its cells being unable to effectively handle such a large quantity of one in the face of an obvious deficiency of all others. Probably, therefore, toxic conditions are brought about similar in effect to the state of things produced in the animal stomach by the same means.

We have several times discussed the question of the nitrogen element in plant-food, and have pointed out means of supplying ground under crops with nitrogen from the air at comparatively no cost, by means of turning under a growth of crimson clover and other legumes; this to be followed, as well as preceded, by the creation of soil conditions, with the application of lime, so that the soil-bacteria by which, only, nitrogen can be turned into nitrate, may be increased and enabled to carry on their work, and along these lines soils may undoubtedly have their nitrogen content greatly increased, and thus the direct purchase of the very expensive nitrogen be avoided. Circumstances may, however, arise so as to cause the application of nitrate of soda, sulphate of ammonia, blood, and other highly nitrogenous and easily available plant-foods to be a profitable procedure. Such circumstances may be: previous neglect, a period of cold rain, or some other exceptional state of things which may retard plant growth. The important point is to use as little as possible of these at one time. A small application several times during the growing season being preferable and more economical. With nitrate of soda an application should not exceed two hundred pounds per acre at any one time, and even this quantity is better divided in two and used at three-week intervals. The quantity for a small area may be gathered from the fact that three hundred pounds to an acre equals one ounce to the square yard.

As mentioned above, the harmful effects of large doses of one element of plant-food in an available condition is intensified when there is a paucity of other elements in a similar condition. Like animals, plants must have properly balanced rations; excess of one does not make up for deficiency in others, but, further, deficiency in any may render excess of one actually harmful. In the case of ourselves, we know that the consumption of a large quantity of a food rich in proteid eaten alone is harmful, but if we consume carbohydrates or starchy food at the same time, the effects of the excess of proteid are counteracted; further, the use of starchy food really decreases the amount of proteid consumed. Practically the same thing occurs with plants. A given quantity of soil-water can only hold a certain quantity of material in solution, and the water will naturally take up the largest amount of that ingredient which exists in a soluble or available condition in the greatest quantity. When there is a sufficiency of all the necessary plant-food ingredients in a condition to be absorbed by water, the latter will naturally not contain an excess of either. It is, therefore, of fundamental importance to place a properly balanced ration at the plant's disposal.

It is difficult to separate the effects of a lack of food from those of a lack of water, since plant-food is mainly conveyed to the plant in the soil water. But even with a proper water supply, if one or more of the required food materials are absent, a normal plant structure cannot be built up. Insufficient food dwarfs the plant in all its parts. A dwarfing in the size of the plant body may occur, however, without a corresponding dwarfing

of fruit or seed products; hence plants often bear their maximum amount of seed or fruit without attaining their maximum dimensions. In this connection some fruits are specially grafted upon dwarfing stocks to prevent the undue growth of the plant body at the expense of fruit production. Plants grown for seed or fruit are, therefore, less likely to be restricted in yield by insufficient food than those grown for their leaves, stems, roots or tubers. The cereals, for instance, produce well upon land not sufficiently fertile to yield equally good crops of beets, cabbage, celery, lettuce or potatoes. At the same time, with sufficient restriction of food, the seed or fruit product will suffer diminution, or be wholly cut off.

Obviously, crop-growing tends to reduce plant-food in the soil in proportion as the fertilizing components are removed from the land and are not returned to it, directly or in equivalent. At the same time, no amount of cropping will by itself render a soil absolutely infertile, because a certain amount of plant food is constantly being liberated by the disintegration of rock or soil materials, this disintegration being increased by good cultivation. But the largest returns are impossible without restoring to the soil certain materials that continual crop removal invariably reduces below the limits of satisfactory yield.

Of the dozen or so materials necessary to the plant as food only three are of direct importance, and are most likely to be deficient, in considering a plant's food supply; these are nitrogen, phosphorus and potassium. One other, lime, is required but little as actual food, but it is of great importance indirectly on account of its mechanical action on the soil; its chemical action on the soil ingredients; its action in correcting undue acidity, and its favorable effect upon the beneficial soil bacteria to which it is indispensable. The remaining food elements necessary for plant life are only required in such minute quantities that there is invariably sufficient of them in all soils, so that it is never necessary to supply them.

Nitrogen is the most important element of plant-food because it is liberated scarcely at all by rock decay, and is the most expensive to buy. Free nitrogen, while being a very abundant constituent of the air, plays no direct part in plant nutrition. At the same time we can make use of this atmospheric nitrogen and supply it to the soil at comparatively little cost. Leguminous plants, such as peas, beans and clover require a larger quantity of nitrogen in their food than most other species, but even when the entire crop of these is removed the soil is always left richer in nitrogen than it was before; further, these leguminous plants are benefited little or nothing by the direct application of any form of nitrogenous fertilizer. Leguminous plants obtain their nitrogen through the agency of bacteria, which act upon the free nitrogen of the air. These bacteria are practically parasitic, microscopic plants living in the tubercles, which can be seen upon the roots of the host plants; they change the atmospheric nitrogen into nitric acid, which, combining with some base such as lime, becomes a nitrate, and is available as plant-food. It will be readily understood that if, when a crop of leguminous plants is removed from the ground it is left richer in nitrogen than it was before, how very great must be the enrichment in this element when we return the entire crop to the soil, as can be done in several ways, one being to sow crimson clover in August and turn it under before the ground becomes frozen.

The entire process of changing nitrogen into nitrates by these bacteria, and by which means only nitrogen is rendered available as plant food, is known as nitrification. The conditions affecting the growth and work of nitrifying bacteria are similar to those affecting plant-life in general, since nitrification results from plant life. As it takes place below the soil surface, nitrification is encouraged by the same conditions which favor the root growth of land plants, namely, aeration, warmth and moisture. Conditions which make for the most active plant growth favor nitrification. There is little doubt that the process also indirectly releases other food ingredients contained in organic matter. Nitrification does not go on to any extent in an acid soil, therefore, soils should be kept sweet by periodical moderate dressings of lime. In addition to other benefits, lime also liberates phosphoric acid and potassium.

There is never much available nitrogen present in the soil at any one time, the greatest quantity being found at the end of Summer, especially if it has been a comparatively dry one. Nitrates are easily washed out of the soil by heavy rain, and as they require warmth for their production, therefore, the surface soil is invariably poor in nitrates in the Spring on account of their being lost through Autumn and Winter rains, and there is great waste of available plant-food, as a whole, when cover crops are not used. For this reason the direct application of available nitrogen in the form of nitrate of soda is especially useful for early garden crops started when the soil is too cool for very active nitrification.

In purchasing a nitrogenous fertilizer, the special purpose for

which it is required should always be considered. Under some conditions, such as that above mentioned, and for forcing a crop on an impoverished soil, nitrate of soda is the most satisfactory. When a plant-food is desired which will give up its nitrogen by degrees throughout the season, something that has the nitrogen in a less available form will be preferable, such as cottonseed meal, tankage, bones and blood. There is annually expended in purchasing nitrogenous fertilizers a large amount of money which could be saved if a larger share of the nitrogen for crop purposes were obtained indirectly from the air through the agency of legumes.

Phosphorus is used by plants in the form of soluble phosphoric acid, which exists in the soil in combination with lime, alumina, or other base, as phosphates of these substances. It is purchasable in the form of acid phosphate, which is mineral phosphate rock treated with acid, ground bones and basic slag. The best form is that of bones, and the finer the bones are ground the quicker their action. Bones are a very safe fertilizer, which acid phosphate is not. Any excess of available phosphate in the soil is retained by it as phosphoric acid, and is not readily washed out.

Potassium is used by plants in the form of potash or carbonate of potassium (K_2CO_3), and is found in Nature largely in combination with silicon and other elements, forming silicates, which undergo slow but continuous disintegration with liberation of potassium salts which become food for plants. The direct application of potash is rarely necessary and never in any large quantity, especially on soils containing any appreciable amount of clay, as the average soil contains sufficient for many thousands of plant generations. Potassium in the soil is brought into an available condition by the action of lime. Wood ashes are an important source of potash, although very variable in composition, the range being from five to ten per cent, provided the ashes are unleached; the ashes of soft woods, like pine, contain only about one-tenth of the quantity found in the ashes of hard woods, like oak. Potash is found in all vegetable matter and stable manures, being liberated upon their decomposition. Wood ashes are an excellent dressing for sandy soils, these being generally poorest in potassium. Wood ashes may also be used as a source of lime, but, measured by itself, it is more expensive to buy lime in this way. An application of wood ashes should not exceed three hundred pounds per acre, and should never come into contact with seeds; it is best worked into the surface a few days before seeding.

To some extent, plants suggest their own needs in the way of food, so long as they are not suffering from drought. As a rule, a lack of available nitrogen is indicated by a pale green or yellow foliage, or small growth of leaf or stalk. Excess of nitrogen is indicated by a very large growth of leaf or stalk, with imperfect bud-, flower- or fruit-development. A deficiency in the supply of phosphoric acid is generally the cause of scanty crops of light or shrunken seed on plants of normal size. Lack of potash is invariably the reason for small crops of inferior fruit when this is accompanied by satisfactory growth.

As previously mentioned, endeavor should be made to place a balanced ration at the disposal of the plant, and undoubtedly the best means of attaining this end is by the use of stable manure. As it leaves the stable it is a perfectly balanced food, although it varies somewhat; also its composition and value may become greatly deteriorated by subsequent bad treatment, either by over-fermentation, or by having much of its most valuable constituents washed out by rain. Plant-food to the value of many millions of dollars is yearly allowed to go to waste by want of care in treating stable manure.

Stable manure benefits the plant and the soil—both being practically the same thing—beyond what it supplies in the way of food. It is not exactly known why such benefit results, but the fact remains that a given quantity of plant-food in the form of stable manure will (all other things being equal) produce far greater results than the same quantity of food supplied in any other form. We have previously suggested in these columns that stable manure may contain something which acts in connection with plants in the same way that vitamins act in connection with animals. Not only is this likely in regard to stable manure, but it is more or less equally so in connection with all manures of an animal or vegetable origin. Be this as it may, practical men have for long been aware that a given amount of plant-food supplied by organic is of far greater value than the same amount in the form of inorganic fertilizers. The pulverized stock-yard manures obtainable in bags are a useful and convenient substitute for stable manure when the latter is unobtainable; they should, however, be worked into the surface of the ground rather than spaded under.

To obtain the maximum amount of return from the food supplied to plants we must see that as far as possible all the hygienic conditions suitable for plant life are present.

Departments of Foreign Exchange and Book Reviews

MODERN MICHAELMAS DAISIES

Perennial Asters, when rightly placed, may be reckoned among the most precious of autumn-flowering plants. Although they are quite old inhabitants of English gardens it is only within the past decade that any great improvements have been made in the race. The limited range of colors which existed in nurseries some quarter of a century ago is quite familiar to those who were then lovers of this beautiful family. Words are inadequate to portray sufficiently the marvellous innovations of modern horticulture; purples in every shade, soft lavenders, blues of every hue and wonderful pinks. These are what we now look for in an up-to-date collection.

In the *Amellus* section alone there is quite a host of beautiful varieties. Readers of the Georgics will remember the description that Virgil gives to this old Italian Starwort. It remains for the modern poet to immortalize its worthy descendants. King George is one of those, and is meeting with rapid recognition. The immense flowers are of a bright bluish-purple, while the golden disc in the center renders its appearance still more striking. The plant grows to a height of 2 feet, and the flowers are freely borne throughout September. Then in the *Noxi Belgii* section I would specially name Feltham Blue and Perry's Pink as being unique as regards color of flowers. Brightest and Best is another of the family which is making a name for itself. The plant grows 5 feet high and produces lovely panicles of rosy-purple flowers. Nancy Perry is a worthy descendant of *alpinus*, having large lavender-colored flowers with three rows of ray florets. The *crucoides* group furnishes us with some very fine kinds. To name only two, we have Enchantress, which bears dainty sprays of pale pink blossoms, and Delight, the flowers of which open up white and pass to a delicate pink.

The proper value of Michaelmas Daisies is best appreciated when they are grown in bold groups of one color. It is impossible to judge of the merits of the various kinds when seen growing in the beds at nurseries. The finest shades are sometimes killed by unsuitable associates. When selecting positions in the garden for planting Michaelmas Daisies the best effects are produced by space and perspective. By allowing sufficient space round each group there are no obtrusive colors to spoil the true value of any selected shade, while the value of distance is too obvious to dwell upon. Of course, many desirable features may be formed by the introduction of quiet harmonies or pleasing contrasts, and in the case of Asters there are great possibilities. I have seen very pleasing effects by growing some of the bright purple kinds in association with red-hot pokers, while a mass of the same color against a dull red brick wall always gives a telling effect. The purples and whites or blues and whites also make very attractive groups.

They will thrive in most garden soils, but, like many perennials, they pay for generous treatment in the way of manure and deep soil cultivation.—*Gardening Illustrated*.

GAILLARDIAS

Wherever the very showy Gaillardias are once grown they are always grown, for by experience their several distinctly good points quickly reveal themselves. They are, for instance, practically weatherproof. Under the hottest sun, when, maybe, other plants are apparently lifeless, or thereabouts, Gaillardias are in perfectly happy mood, raising their brilliant heads of color well up on straight, stiff stems, as though oblivious to such things as variations of temperature. Heavy rains seem to affect them just as little.

Few flowers can equal them as cut blooms, and on this account they are favorites for home decoration purposes. They need, of course, to be gathered young, i.e., before the ring of petals has become quite flat. As exhibition subjects, too, they are invaluable, and if given reasonable time soon recover after a journey. The plants possess, however, one eccentricity, especially those more than a season old. They sometimes throw up quite good and healthy ground growths, but without flower-spikes. In order, therefore, to obviate such a disappointment occurring, as well as to increase one's stock of plants, any clumps that may not have flowered should be lifted in August, dividing out the rootlets into light soil a few inches apart. Growth emerging from flowering plants may, of course, be treated similarly. It is well to mark the spot, because frequently the leaves die quite away; but this should not be taken as a sign that the roots are dead. In due time they will spring up. Apart from a dressing

of some insecticide, soot or lime, no further attention will be necessary until removal in Spring to more permanent quarters in the border, either singly or in clumps of three or four, the latter giving a bold effect.—*The Garden*.

PYRETHRUMS

The value of these flowers in the garden during Summer and Autumn cannot be over-stated. Since some of our healthy plant specialists took them in hand, and commenced crossing and selecting the best obtainable, some very beautiful varieties have been raised. In the Pyrethrums we have both single and double forms, and they are exceedingly popular, though I must confess to a partiality for those with single blossoms, the beautiful glowing crimson-scarlet James Kelway being an ideal flower of this section. Apart from their use in the herbaceous border, I think these modern Pyrethrums might well be grown in large lawn beds, one variety massed in a bed. I have seen this attempted on one or two occasions, and although the work was only done in a half-hearted manner, the effect was excellent. As already stated, there are now so many beautiful varieties to select from that quite a good color-scheme of beds might be worked out on the lines laid down by Miss Jekyll in her book, "Colour in the Flower Garden." Nor must we overlook the value of Pyrethrums as cut flowers. Their slender, graceful stems are ideal for arranging in vases and large bowls, and they last quite a long time in water. This is where they score over the more stately Delphiniums, which so soon drop their exquisite spurred flowers when cut.

Pyrethrums can be induced to flower again in the Autumn, and the work necessary to bring about this desirable end is not very difficult or irksome. Before seed has had an opportunity of forming, they must be cut down quite close to the ground, leaving the natural basal foliage of the plants intact. After lightly stirring the soil around the plants place a 2 in.-thick layer of manure around them. If this work is carried out immediately after the first flowering, practically all the Pyrethrums will give us their beautiful and pleasing flowers again in September.—*The Garden*.

SWEET-SCENTED FOLIAGE IN THE GREENHOUSE

Plants with scented foliage are always admired, and those who appreciate the old-fashioned nosegay like a few cut sprays of some sweet-smelling subject added to it. Among greenhouse plants suitable for this purpose are the

SCENTED-LEAVED PELARGONIUMS, at one time extensively grown, then very much neglected, but now coming into favor again. A prominent feature of the scented-leaved Pelargoniums is the great variety in the fragrance of the different kinds. Among the perfumes represented is a Lemon-like fragrance, while the distinct-looking *Pelargonium tomentosum* would, from its smell, be at once taken for a Peppermint. Another plant remarkable for its scented foliage is the

LEMON-SCENTED VERBENA (*Aloysia* or *Lippia citriodora*). In the favored parts of the country this will survive the Winter out of doors, but, generally speaking, it must be regarded more as a greenhouse than a hardy shrub. Large specimens grown in tubs are very useful for terraces or similar positions during the Summer months. Complaints are sometimes made of a difficulty in striking cuttings of the Lemon-scented Verbena, and this is certainly the case if the cuttings are formed of the firm, ripened shoots. If, however, the young, soft shoots are taken in early Spring, and dibbled into pots of sandy soil, without allowing them to flag, they root readily if they are put into a close propagating case with a gentle heat; indeed, under conditions suitable for Fuchsias, Heliotropes, and other soft-wooded plants. The

MYRTLE (*Myrtus communis*) is also admired for its fragrant leaves, in addition to which it is a valuable evergreen shrub, quite hardy in mild districts. The pure white, sweet-scented blossoms are also a very valuable asset. Like the Lemon-scented Verbena large plants in tubs are also valuable in many ways. Another plant with a delicious Citron-like fragrance is

EUCALYPTUS CITRIODORA.—As is well known, the various species of *Eucalyptus* produce two quite distinct types of foliage, and in the case of this kind it is the young leaves, which are rough and hairy, that possess this perfume in such a marked manner. The same remark also applies to the ordinary Blue Gum (*Eucalyptus globulus*), whose large, firm-textured leaves have but little of the scent common to the foliage borne by young plants. The scent of *Eucalyptus globulus* is appreciated by some, but, on the other hand, many do not care for it. It is different, however, with *E. citriodora*, the fragrance of which is generally liked. These

Eucalypti are best raised from seed in a gentle heat in early Spring, as they then grow away freely and soon form effective plants. The

PINEAPPLE SCENTED SALVIA is remarkable for the scent given off by the leaves when they are slightly agitated, but if they are at all bruised the pleasing fragrance is superseded by a stronger and less pleasant one. A very old plant with scented leaves is the

BALM OF GILEAD, which used to be known as *Dracoccephalum canariense*, but now known as *Cedronella triphylla*. It is valuable in the greenhouse, and used to be much grown, but is now rarely met with.—*Gardening Illustrated*.

SIZE IN VEGETABLES

It is probable that much discussion will be evoked by the announcement made that the Royal Horticultural Society had decided to place quality before size in judging vegetables. There will naturally be on all hands a good deal of sympathy with the proposal which, after all, is only an extension of a practice introduced some years ago with respect to the trials of potatoes at Wisley. But although everyone will agree that unless vegetables are of good flavor mere size is no recommendation, yet those who know most of the art of cultivation will foresee grave difficulties in the general and consistent application of the cooking test. For example, the length of time which elapses between picking and exhibiting—which necessarily varies with the distance of the exhibitor from Vincent Square—makes a large difference in flavor between two vegetables of the same kind and variety. Moreover, although large size is in some cases an undesirable quality—in carrots and turnips, for instance; in the case of other vegetables it may be the best possible guarantee of good quality. Who, for example, would eat small leeks when he could get large ones, or who would not prefer the inside stalks of a large-grown head of celery to those from a small-grown head? Little brussels sprouts have, unless we are mistaken, a stronger dose of the objectionable cabbage flavor than have large sprouts. But behind these questions of individual taste there remain larger and more important ones. The main purposes of exhibitions are to demonstrate and encourage horticultural skill and to spread knowledge of gardening. It is easier to grow a thing of moderate size than of maximum size, and hence in default of a better method, size has come to be one of the chief criteria of excellence. Needless to say, it has never been among good judges the only or the chief criterion, for the somewhat indefinable but very real question of quality has always been insisted upon by them. Everyone knows that among fruits size beyond a certain point means often a decrease in flavor; but, on the other hand, commercial horticulture, the interests of which must not be forgotten, has to consider the marketing quality of the fruit no less—and we fear sometimes more—than its flavor. The best-flavored strawberries, for instance, rarely reach the market, either because they are relatively poor doers or because they do not travel well. Hence, it looks as though it would be necessary for the Royal Horticultural Society to create, in some cases, new classes and to distinguish between those of fruit and vegetables which are best for private and for commercial use. It is certainly a praiseworthy work to endeavor to improve popular taste but, unless we are mistaken, it will prove very difficult. If successful, this work will lead in a much desired direction, namely, towards improvement of flavor instead of mere augmentation of size. It will, we hope, lead yet further—namely, to the improvement of the feeding-value of vegetables. Work in this direction was initiated some years ago at Wisley. Even so far as it has gone this work has shown that marked differences of feeding-value exist between different varieties of potato, and there is little doubt but that similar differences exist between varieties of other vegetables. Even there the room for research does not cease; for vegetables provide, as is now well known, accessory food bodies which play important parts in maintaining health. Indeed, it is probably no exaggeration to say that it is upon the amounts and kinds of these vitamins that the food values of vegetables chiefly depend. To test these, however, is beyond the powers even of a chef, and we must at present admit our ignorance as to whether different varieties of vegetables have different vitamin values.—*The Gardeners' Chronicle* (British).

WITHHOLDING LIME

Some crops, like potatoes and rhubarb, grow better without lime than with it; both of these prefer a rather acid soil, and in the case of potatoes, one of the pests—the well-known potato scab—can flourish in a lined, but not in an unlined, soil. Both on account of its manner of growth and to avoid this pest therefore, the potato crop is better without a direct application of lime than with it. Again, in the few experiments that have been made, tomatoes have done better without than with additional lime, but in these cases there was already a certain proportion of lime in the soil. Where raw sub-

soil is being turned up it seems highly probable that a dressing of lime will be valuable; where, however, only the surface soil is being dealt with, the need for lime must depend on the crop. The cabbage tribe, swedes, etc., are usually the first to suffer from shortage of lime, and they show the effect by the well-known finger-and-toe or club-root, which is not to be confused with the club-root of tomatoes, or the galls produced by certain insects on swedes.—*South African Gardening and Country Life*.

FLOWERS FOR AN EDGING

Aubrietia and dwarf *Campanula* are to my mind extremely suitable for edgings. Snails and slugs harbor everywhere, but we might as well have flowers for an edging as stiff clipped Box, and we can grow Spring-flowering bulbs in such edgings as *Aubrietia* and *Campanula muralis*.—*The Garden*.

Grafting Wax or Tree Styptic.—The very best grafting wax I have used is made as follows:—Melt together in a glue pot or similar vessel 16 oz. of common rosin or resin (powdered), 8 oz. of methylated spirit and 1½ oz. of olive oil. Apply with a small brush. In a few days it will set hard on the grafted part. The melted wax keeps in a liquid state for several days, and can always be re-melted. It is cheap and good.—*The Gardeners' Chronicle* (British).

Leaf-Mould.—It is not wise to use decayed leaves of Walnut, Horse Chestnut and Sycamore in quantity for pot plants, though they can be used safely out of doors. The reason they are unsuitable for pot plants is a mechanical one, for they do not exert the same opening effect upon the soil as leaves like Oak or Beech. The leaves of Oak and Beech form better leaf-mould than the leaves of other trees.—*The Garden*.

DEPARTMENT OF BOOK REVIEWS

SCIENCE OF PLANT LIFE, by Edgar Nelson Transeau; World Book Company, Yonkers-on-Hudson, New York.

As a high school botany this polished little work seems to be, in plan and in execution, without a flaw. Its accuracy, thoroughness and workability are testified to by the fact that before it was issued it was carefully examined and tried by not only able scholars but persons actually teaching the subject in various parts of the country. It is a work valuable to all students of plant life, theoretical and practical, for it shows "full appreciation of the fact that the fundamental reason for giving botany a place in our general scheme of education is that it is the natural scientific background for the great plant-producing arts." The author is "one of those who think that our work in botany should serve as a basis for agriculture, horticulture and forestry, just as physics and chemistry form the natural background of our industrial and manufacturing life." "The fundamental aim of this text is to give the pupil understanding of how a plant lives and is affected by its environment." Gardeners in general should be glad that there is available a book like this to quicken, in the developing minds of the young people, appreciation of the things, and love for them, that immediately not only maintain all physical life but also foster to so great an extent the things that are above and beyond "bread alone."

THE AMERICAN ROSE ANNUAL—1921, edited by Horace McFarland; published at the Editorial Office of the American Rose Society, Harrisburg, Pa.

The new handbook, which goes, with a hearty welcome of course, into the hands of the more than 2,200 members of the society drawn together by worship of the Queen of Flowers, is again an example of perfect editing. The many pithy articles include the usual valuable record of Doctor Van Fleet's work, the results of practical experiments, under the many varying conditions that surrounded the culture of a flower so universally cherished, and the usual lists, becoming yearly more interesting, of varieties new and old. Four articles are of outstanding note-worthiness. One is a splendid account of Roses in Antiquity. The second, composed with similar scholarly skill, is entitled Roses—Clergy—Churches. The third tells how "the desirability of using our native roses, commonly called wild roses, for various purposes in landscape design, as well as a cover for unsightly places, embankments and the like, is being gradually recognized by our landscape gardeners and rosarians." It goes on to tell how "if the habits and beauty of the wild roses had long since been realized, they would have been extensively availed of." There follow well thought out lists of the various species for different regions, sites, soils and purposes. A fourth reveals how few are the roses offered by traveling agents, and how inferior the varieties; every one who reads must feel impelled to urge the nurseries that sell through brightly colored pictures carried about the country, to mend their ways, in justice to the rose and to people who are not informed by such a medium as the Rose Annual.

Examinations for Professional Gardeners

ARTHUR SMITH

THE question of instituting some test whereby it would be possible to measure, sufficiently for all practical purposes, the qualifications of any one following the craft of gardening as a means of livelihood, so as to distinguish between those qualified to be classed as professional gardeners and those calling themselves gardeners but who have little or no claim to be considered as such, has been agitating the minds of many of us for some years, and today there are a considerable number of our profession who consider that the time has now arrived to take some action upon the matter, in fact many members of this association have been for a long while complaining because some active steps in this direction have not been taken before.

Here and there, upon various grounds, some opposition to any scheme of examinations has been voiced, many of which are so absolutely frivolous and illogical as to be unworthy of notice. There is one, however, worthy of consideration, because if the reason given for it were true it would be perfectly logical, but it is based upon an entire misconception of facts.

An idea appears to exist that examinations would necessarily be entirely confined to mere book knowledge, to theory, or to the scientific side only. If such were the case it would be perfectly true to say that examinations could find out nothing about the professional qualifications of a man calling himself a gardener. At the same time it would be equally true that an examination upon a man's practical knowledge *only* would be unsatisfactory. All the practical work of gardening is based upon scientific principles and no one has the right to call himself a professional gardener who has not some knowledge of these principles. Practice teaches us how to do a thing, while science teaches us the whys and the wherefores of doing a particular thing, or doing a thing in a particular way, and the professional gardener's knowledge should combine Practice with Science.

A good deal of prejudice against science is caused by ignorance of what science really is, and by the confusion of mere theory with scientific fact. Science and practice are sometimes spoken of as though they were distinct, and even antagonistic. Fortunately, among the more advanced gardeners, a better knowledge is beginning to prevail and is dispersing this fundamentally wrong conception of the matter. Science and practice are really so closely akin as to be almost interdependent. Many gardeners have more scientific knowledge than they are aware of. Science, as the word itself means, is true knowledge, and whatever knowledge of the underlying principles of his profession a man may possess—whether he has gained that knowledge by intelligent observations and experiments during his years of practical experience; or by study at the Fireside University; through a Home Correspondence Course, or at college—so far as that knowledge is true, it is scientific; if untrue, it is unscientific. A theory has necessarily nothing whatever to do with science. Sometimes purely scientific men give expression to theories which purely practical men consider impractical, but these theories are not put forward as scientific facts, but as opinions as to possibilities to which scientific facts appear to point. Many college men have proved failures when placed in charge of gardens and estates, not because of the much or little scientific knowledge they may possess, but in spite of it, by reason of the fact that they have had no practical experience, therefore their knowledge is, so far as it goes, only one-sided. College education can be very valuable in more ways than one, but it is valueless unless supplemented by some years of practical work in a garden, by practical work I mean actual working with their own hands, not merely looking on at laborers working in a good, bad, or indifferent manner.

No one knows it all. Those of us who have studied and worked at our profession the longest are those who see most clearly the greatness of the unexplored fields of knowledge which our profession possesses.

The professional character of our work as combining Science with Practice has become established in the world. When Universities like Oxford, Cambridge and London confer Degrees in Horticulture, the rank and file of the horticultural profession should do all in their power to make themselves as worthy as possible of the term professional gardener. Sooner or later, those refusing to recognize the necessity of educating themselves or of being educated in the scientific principles of their profession, will find themselves compelled to take a back seat.

The instituting of examinations can do us nothing but good, either as individuals, or collectively as an association of professional men. The work of our association, or as many of us would be willing to say, the work of one man, has, in spite of opposition, placed our profession upon a higher plane than it has, in this country, ever held before. It is our duty to strengthen

and increase the position to which we have attained. There is nothing which will facilitate work to these ends more than professional examinations.

Before outlining a scheme for the carrying out of such examinations, it does not appear out of place to take time to consider something of what has been done in this connection elsewhere.

Some of you are doubtless aware that about ten years ago the Royal Horticultural Society of England initiated a scheme whereby a National Diploma in Horticulture can be gained by those who pass the Preliminary and Final Examinations required. It is worthy of note that this scheme was practically initiated by employers and not by gardeners, as not more than five per cent of the latter are fellows of that society, but it has been generally welcomed by professional gardeners for whom only it is applicable, and has received the unqualified support of the British Association of Gardeners. The main reason publicly given by the society for holding the examinations was because of the fact that a number of men existed calling themselves professional gardeners who were quite unqualified to be classed as such, and the examinations would give the real gardener an opportunity of being branded as such. If this reason for instituting examinations exists in Britain, it certainly exists here in tenfold intensity.

In discussing any scheme applicable to conditions in this country it appears fitting to set forth briefly the main points connected with the manner in which the examinations for that diploma are conducted and one or two of the rules governing them. These conditions and rules have been modified from time to time during the ten years the examinations have been held and we today can have the advantage of the experience they have gained in this direction.

The examinations are open to both men and women who have taken up the profession of gardening as a means of livelihood.

Candidates must be "accepted" by the Society who produce evidence of grade school education and of personal character, and with their application remit a fee of about fifteen dollars, which covers both examinations.

Before sitting for the Preliminary Examination candidates must by the date of the examination,

- (a) Have reached the age of twenty-one years, and
- (b) Have served at least four years in a public or private garden, or in an approved Horticultural Institution, or partly in one or other; and they must be able to produce a satisfactory report as to their work and conduct during that period.

The passing of the Preliminary Examination does not entitle the candidate to any form of diploma.

The Final Examination is open only to those who have passed the Preliminary, and who can produce a certificate or certificates that they have been employed not less than six years regularly in garden work. They can accordingly present themselves if they wish, for the Final Examination next following the Preliminary which they have passed, if they can produce such certificate.

In both examinations the principal part consists of tests of the candidate's practical acquaintance with plants, general garden work and practical knowledge of horticulture generally. These tests are carried on in a suitable garden, the use of which has been granted for the purpose, and are at the same time supplemented by questions as to the whys and the wherefores of the work which the examiner has called upon the candidate to perform, so as to test the latter's knowledge of underlying principles. In the Preliminary Examination this test takes a day, and in the Final two whole days are taken up with it.

Candidates are required to pass in all three parts of the examinations—practical, *viva voce* and written but no amount of excellence in the written part will qualify a candidate if he fail in the practical.

The written examinations are held simultaneously in as many parts of the country as necessary, and are under the charge of a supervisor, who has been previously arranged for by the candidate. Supervisors are unpaid and are generally public school principals, justices of the peace, clergymen, or any other responsible persons approved by the Society. Supervisors have to see that no conversation takes place in the room between candidates, that they bring into the examination room no paper, books, etc., nor, unless by the permission of the supervisor, are they allowed to leave the room during the examination. These supervisors are in no sense examiners and have nothing to do with adjudicating upon the candidates' papers.

Applications have to be sent in two months before the date of the examinations, and blocks of paper are prepared, having on the first page a numbered form on which the candidate has

to fill in his name and address, and himself place it in an envelope addressed to the secretary and seal it; each leaf of his block is stamped with a number corresponding to that upon which he has written his name and address. These blocks with examination questions are sent direct to the supervisor, who unseals them in the presence of the candidates, gives them out, collects them at the expiration of the appointed time, reseals them before the candidates leave the room and forwards them to the secretary, who is the only person who knows the number corresponding to the candidate's name. When the answers have all been received by the secretary, he places them in the hands of an Examining Board for adjudication. There are various other points and regulations connected with these examinations but to which it does not appear necessary to refer.

The Final Examination is, in the words of one of the secretary's reports, "really a stiff ordeal," but no one can say that it is too stiff to qualify for such a high mark of distinction as the Diploma of that Society. Since its initiation that Diploma has been gained by head gardeners of between fifty and sixty years of age, as well as by others of all ages. It is worthy of note that in one of the reports it was stated that practical gardeners who had had no college education but who had evidently studied the principles of their profession at home, showed a higher degree of all-around excellence than that shown by many who had passed some years in a horticultural college.

As regards ourselves it does not appear necessary at the present juncture nor for the purpose we have in view, to institute examinations of such a wide and as searching a character as those necessarily adopted by the Royal Horticultural Society for its Diploma, although if we can later on do so, so much the better. It seems that we might eliminate the working and *viva voce* tests in a garden, immensely valuable as of course these are, and confine ourselves to a paper examination, the papers being so designed as to embrace both the principles and the practice of gardening.

Written examinations upon both the practical and the scientific sides of plant culture are constantly being held by the Civil Service Commission in this country for positions connected with the United States Department of Agriculture which have to be filled by competitive examinations. I have before me as I write particulars of some of these examinations relating to Horticulture which sometimes take two days, and which have been kindly sent me by a friend in the Department. From what has been and is being done in this country in connection with these Civil Service Examinations it appears very clear that there is no difficulty whatever in ascertaining by this means a man's knowledge to a sufficient degree to enable us to grant a Certificate of Competency in Gardening, and I do not see anything which cannot be overcome to prevent us arranging these examinations under proper supervision in any part of the country in which candidates may reside.

The questions would naturally be the same for all candidates and would have to be drawn up and printed beforehand under such safeguards that they could not possibly become known to a candidate before he reached the room in which he would write his answers. It should be quite easy to obtain the use of a room in a school house, say on Saturdays when the school is not in session, and one would suppose that some individual can easily be found in any locality who would give a few hours to the supervising of the examination and sending the papers back.

The more important of the regulations connected with the examinations might stand as follows:

- The examinations are only for those who are following gardening as a means of livelihood.
- Candidates must be accepted by the National Association of Gardeners and at the time of making their application must be at least 25 years of age.
- They must enclose with their application evidence showing that they have been continuously engaged in gardening for at least six years.
- Remit a fee to be agreed upon.

The regulation as to having worked in a garden for at least six years seems to me very important as securing at least that amount of practical experience before being eligible for a Certificate of Competency, but such evidence need not be required from those who have been for at least six years active members of our association.

There would be, of course, a number of minor details and regulations to draw up, but it does not appear necessary to go into them now, nor to discuss the questions to be set for examination papers. If you agree upon the principle and decide that these examinations should be held, then the arranging of the entire regulations could be left to a committee. It would appear advisable that such committee should have delegated to it full powers to carry on the work and to spend any money necessary for so doing. It also seems desirable that if this committee is appointed it should be composed of men residing within reasonable distance of each

other or of a common center, so that there would be no obstacle to their all meeting together. We cannot get these examinations started too soon, and it should be endeavored to hold them before the end of this year if possible.

The holding of these examinations would mark a vital and a far reaching step in advance along the lines of increasing the professional standing, not only of ourselves as individuals, of our Association, but of the profession of gardening generally, and we should by this means be acting up to both the letter and spirit of the object of our Association as set forth in section 2 of the first article of our constitution and by-laws.

The more we can impress estate owners with the professional character of our calling, that in the true sense a gardener is a man who has been specially educated for his work and whose professional knowledge necessarily embraces at least some acquaintance with the many scientific principles upon which the practice of horticulture is based, the greater will be the respect which we shall command and the better will be the conditions surrounding our work. Increasing the prestige of our Association and of the profession for which it stands is the more important today by reason of the fact that we are receiving a constantly increasing amount of not only passive but of active co-operation from estate owners. Several instances have occurred of one estate owner recommending our association to another as being worth while, and in some cases owners have joined us when their head gardeners or superintendents have not thought fit to do so.

It almost goes without saying that the higher the level to which we can bring our professional qualifications the greater the support we shall deserve and receive from those who employ our professional services.

The greater the respect which we can show we have as individuals for our profession, the greater the respect others outside of it will have for us. No one thing will tend to show our appreciation of what gardening stands for more than the institution by ourselves of examinations for proficiency; these examinations are equally necessary to protect us from the stultifying influence of quack gardeners. British gardeners waited for their employers to protect them by instituting such professional examinations. Let us have the greater honor of starting them ourselves for ourselves.

MAY BIRDS

(Continued from page 580)

May 6	Grinnell's Water Thrush	Golden - cheeked
	Cat Bird	Warbler
	Rose-breasted Grosbeak	Virginia Rail
	Prairie Hen	House Wren
	Great Blue Heron	May 13 Cape May Warbler
	Black-crowned Night	Black-throated Green
	Heron	Warbler
	Semipalmated Plover	Green Heron
	Buff-breasted Sandpi-	Migrant Shrike
	per	Red-bellied Wood-
	Rough-winged Swallow	pecker
May 8	Maryland Yellow	Sora Rail
	Throat	Prairie Marsh Wren
	Golden-winged Warbler	May 14 Black-throated Blue
	Nashville Warbler	Warbler
	Blue-winged Warbler	Yellow-bellied Cuckoo
	Tennessee Warbler	Evening Grosbeak
	Blackburnian Warbler	May 15 Black-poll Warbler
	Chestnut-sided Warbler	May 17 Black-bellied Cuckoo
	Prothonotary Warbler	Orchard Oriole
	Crested Flycatcher	Cerulean Warbler
May 9	Magnolia Warbler	Bewick's Wren
	Kentucky Warbler	May 18 Yellow-breasted Chat
	Bay-breasted Warbler	Ruby-throated Hum-
	Redstart Warbler	ming Bird
	King Bird	Wilson Warbler
	Scarlet Tanager	May 19 Night Hawk
	Bobolink	Acadian Flycatcher
	Olive-sided Flycatcher	Kirtland Warbler
	Wood Pewee	Mourning Warbler
	Olive-backed Thrush	Canadian Warbler
	Red-eyed Vireo	May 22 Least Flycatcher
May 10	Least Flycatcher	Northern Parula
	Wood Thrush	Warbler
	White-eyed Vireo	Sycamore Warbler
	Scoter	Indigo Bunting
May 12	Connecticut Warbler	May 26 Yellow-bellied Fly-
	Warbling Vireo	catcher
	Yellow Warbler	May 28 Dickcissel

National Association of Gardeners

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NEW MEMBERS

The following new members have recently been added to our association: E. A. Roberts, Poughkeepsie, N. Y.; Nicholas Vasileff, Greenwich, Conn.; Andrew J. Brinkworth, Cranford, N. J.; W. J. Slade, Greenwich, Conn.; M. Stobie, Rochester, N. Y.; William Hasker, Alpine, N. J.; Fred W. Jackson, New Brunswick, N. J.; John McLaughlin, Oyster Bay, L. I.; John Ellis, Northampton, Mass.; Carl Sarling, Brooklyn, N. Y.; William Churchill, Glen Cove, L. I.; William R. Cobb, Irvington, N. Y.; Henry C. Nye, Springfield, Mass.; Oscar A. Springer, Bridgehampton, L. I.; E. E. Colby, Pueblo, Colo.; Charles F. Twiss, Buzzards Bay, Mass.

AMONG THE GARDENERS

Alex Reid resigned his position as superintendent on the J. J. Albright estate, Buffalo, N. Y., and has accepted a similar position on the Daniel Good estate, Crescent Beach, Ontario, Canada.

I. B. Murphy resigned his position on the Helme estate, St. Davids, Pa., and accepted the position of superintendent on the estate of J. H. Weaver, Merion, Pa.

Frank Balogh secured the position of gardener on the H. L. Thompson estate, Perrysburgh, Ohio.

Kenneth Cedarman secured the position of gardener to B. E. David, Peekskill, N. Y.

Stephen Treglown secured the position of superintendent to Henry Hornblower, Plymouth, Mass.

DAVID GORDON

David Gordon, after a lingering illness, passed away on the evening of May 6 at his late residence at "Sonthleigh," Chappaqua, N. Y., the estate of Mrs. S. Neustadt, of which he was superintendent for a number of years.

Mr. Gordon, one of the pioneers of the gardening profession, was familiarly known as "Dave" among his many friends. He was born in Perthshire, Scotland, 51 years ago. There were many mourners at the funeral when he was laid to rest on May 9 in Kensico Cemetery with full Masonic honors.

Mr. Gordon was one of the first members of the National Association of Gardeners, and will be sadly missed among the gardening fraternity.

He is survived by his widow, three sons, and daughter.

THE SECRETARY'S RETURN TO THE OFFICE

After being away from the office since the International Flower Show, held in New York during March, due to a physical breakdown, the Secretary fully expects to resume his duties on June 1st. In the meantime the routine affairs of the association have been attended to by Mr. Ebel's assistants.

A MEETING FOR THE ORGANIZATION OF A NASSAU COUNTY BRANCH

As soon as the Secretary is physically able to attend a meeting in order that he can answer questions pertaining to the organization of a local branch, a meeting will be held in Nassau County, Long Island, by the members of the association located in that district to consider the advisability of forming a local branch which will direct the welfare and other interests of the gardener through co-operation with the national association.

CONVENTION IN NEW YORK OCTOBER 4 TO 6

The Convention Committee recommends October 4 to 6 as the date for the 1921 convention and New York City as the meeting place. Final decision rests with the executive board, which in the past has always endorsed the recommendations of the local committees. The preliminary program of the convention will appear in the June issue. By this time the date of the convention will have been definitely decided upon.

CO-OPERATION ON THE SIGN BOARD CAMPAIGN

During the past month additional co-operation on the sign board campaign has been secured from influential individuals and from several prominent national organizations which have written to the association's headquarters that they are ready and willing to co-operate in whatever way the association may direct. Members of the faculties of two well known Eastern colleges have manifested an interest and are considering a plan whereby their fellow members of the faculties and the student bodies may also be interested. A woman's farm association, a national association representing the sign board interests themselves, a number of local horticultural societies and clubs have expressed their intent of taking an active part in the movement.

As has already been announced, the Garden Club of America at its winter meeting in New York adopted the resolution passed by the National Association of Gardeners at its St. Louis convention and voted to co-operate with the association. At its annual meeting, held in New York several days ago, pamphlets issued by our Sign Board Committee were distributed and a letter from our Secretary was read, giving details of what has already been accomplished.

Interested parties may obtain pamphlets and any other information they may desire from the office of the Secretary.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD (CONN.) HORT. SOCIETY

The society met on April 8 last for its usual monthly business session at Greenwich.

Mr. Curtis, head of The Westchester Farm Bureau, favored us with a splendid talk on "Soil Fertility." This subject has been thoroughly dealt with by writers in THE CHRONICLE, so that it is unnecessary for me to go into too great detail, but there were some interesting points he spoke of which will be of benefit to many readers.

In America, he said, we are far behind the European countries in tackling soil problems, the main reason having been the unlimited amount of new land to go at when the land in use gave out. Not until recently has anything been taught in the schools here about soil or its products. Mr. Curtis described the necessity of Nitrogen in the soil; how it can be placed there, and how it becomes available by the action of bacteria for plant-life. He dealt at length on the subject of organic matter, giving us many points about its value in the various states that it can be employed in.

A good fertile soil is a soil rich in humus which can only be obtained by the decomposition of organic matter. This action takes place only under certain conditions, three things being essential for the bacteria to separate or tear down the constituent parts of the substance. These are heat, moisture and air. The lecturer gave us examples of cold storage to do away with the warmth, canning various products to eliminate the air, and drying others to take away moisture, thereby preventing any decay.

Mr. Curtis reminded us that in turning under the ground a green cover crop, nine-tenths of it is water, therefore only a small percentage would ever become plant food. He said people had laughed at him because he had many times bought up all the straw stacks he could to plough under his land but that he had had the smile on them when it came down to production.

In giving his hearers the benefit of his knowledge on the most profitable crops that are suitable for this locality and what do not pay, some items on potatoes that were not generally known came to light. Many gardeners have contended that in order to get good crops of this vegetable it was essential to plant large tubers or parts of such, some have relied on medium and small ones, but Mr. Curtis said it does not matter a jot as long as the seed potato came from a vigorous vine that had healthy blood and had produced large tubers.

Many have often wondered why seed saved from good crops grown in this vicinity do not produce good results. A question to this effect was asked and the Farm Bureau head informed us that although the potato came from the South and was originally discovered in lands near the Equator it was found at a high cool altitude in the Andes mountains.

When grown in the humid heat of Connecticut its vitality was lost, and being subjected to at least sixteen diseases it is necessary to seek seed grown in the cool of Maine and New Hampshire which still maintained its vigor. Mr. Curtis answered at the close a battery of questions to the delight of all present.

GEORGE HEWITT, Cor. Secy.

SEWICKLEY (PA.) HORT. SOCIETY

The regular monthly meeting was held Tuesday evening, April 12, 1921, with President John Carman presiding. Approval was given a committee report, fixing September 29 and 30 as the date for a Dahlia show, and November 3 and 4 for a Chrysanthemum show.

Recommendations of the by-laws committee were approved, as submitted at the last meeting and the secretary was instructed to have the revised code printed and distributed to the members as soon as possible.

A letter was read from A. H. Etherington, late gardener to E. A. Woods who is now in business on his own account at Thomasville, Ga., offering three prizes of Rose plants for amateur members of the society for Dahlias exhibited at the show in September. The offer was accepted, and a vote of thanks ordered sent to the donor.

The question box proved the feature of the evening. An interesting discussion took place on a wide range of horticultural practice, many questions coming from amateurs, and some interesting experiences were disclosed. Among those participating in the discussion, were Mr. and Mrs. L. A. Woods, Mrs. Jennings, Miss Christy, Messrs. Carman, Curran, Wm. Thomson, Jr., Katro, Rapp, Roderick Ross, and Gibson. Hy. Gibson.

ST. LOUIS ASSOCIATION OF GARDENERS

The St. Louis Association of Gardeners held its May meeting at the Forest Park Greenhouses on May 4. The circular issued by the N. A. G. Committee on Sign Boards, "A Menace to our Highways," was read and a resolution passed unanimously endorsing this movement. The topic of the evening was a lecture on "Formal Landscape Gardening" illustrated with numerous lantern slides, and delivered by L. P. Jensen. This was followed by considerable discussion. It was requested that the date for the N. A. G. convention be set as soon as possible that Western members may arrange their vacations to be in attendance.

L. P. JENSEN, Cor. Secy.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

I have a little rust in the Begonia Gloire de Lorraine, Glory of Cincinnati, and I have noticed it is on the leaves of the tuberous. I would be glad if you will tell me what to do to stamp it out and keep it in check.—H. T.—Canada.

If the trouble is due to a fungus, spraying with any good fungicide. Fungine, for example, at frequent intervals should prevent rust; affected leaves are better removed and burnt. It is advisable to use the fungicide in a mist-like spray and late in the afternoon. Any necessary watering should be confined to the roots. Sometimes the hot sun shining upon wet leaves, especially through imperfect glass, will cause rust-like blotches, and in any case, overhead watering should be done as early as possible in the morning so that the foliage can dry before the sun gets very high.—A. S.—N.J.

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What would you recommend as an effective remedy for the mite pest in the greenhouses. I have been told by several people to use kerosene, but I am doubtful whether it should be applied at full strength, or diluted. Does kerosene affect the plants, and are its fumes harmful? I should be very glad to have you give me some information on this matter.—F. H.—Minn.

(The following replies were received to the above question, which was submitted to prominent members of the gardening profession. If other readers of THE GARDENERS' CHRONICLE have had experience with the mite pest, we should be glad to hear from them.—Ed.)

Regarding the mite pest, I am not sure exactly what variety of this pest is troubling your correspondent. If it is a cyclamen or begonia mite, kerosene, of course, cannot be used. (Cyclamen and begonia mite infest the leaves, and a kerosene solution would be harmful to the leaves.) If it is in wood or floors, kerosene is safe, and the odor will not affect the plant life at all. If I could be advised more accurately of the nature of the mite, I could give better advice.—W. N. C.—Mass.

If your correspondent will use one wine glass of kerosene to every gallon of water, I am sure he will find it an effective remedy against the mite pest troubling his greenhouses. The solution will not prove harmful to the plants, if the mite is attacking only the roots, and the solution is applied to the soil.—T. P.—L. I.

I suggest that your correspondent use a nicotine solution as an effective remedy against the mite pest. Cyanide of potassium is excellent, but is dangerous in the hands of one not skilled in using it.—A. M.—L. I.

I believe that your correspondent could use a solution of kerosene and water if this is constantly mixed so that the kerosene will not separate; that is, the kerosene rise to the top and the water remain at the bottom of the sprayer. This solution should only be applied to the benches. Especially in the case of cyclamen, where the mite lays its eggs, often on the leaves, this solution could not be used, for the kerosene, unless very carefully applied, will burn them. I strongly recommend using nicotine with a little soft soap dissolved in the solution on the plants, as the soap forms a scum and will aid in smothering the mite, and not permit the eggs to hatch.—J. T.—N. Y.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of "Gardeners' Chronicle of America," published monthly at New York, N. Y., for April 1, 1921.

State of New York) ss.
County of New York {

Before me, a notary public in and for the State and county aforesaid, personally appeared M. C. Ebel, who, having been duly sworn according to law, deposes and says that he is the editor of the "Gardeners' Chronicle of America" and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, managing editor, and business manager are: Publisher, The Chronicle Press, Inc., 286 Fifth Ave., New York, N. Y. Editor, M. C. Ebel, 286 Fifth Ave., New York. Managing Editor, M. C. Ebel, 286 Fifth Ave., New York. Business Manager, M. C. Ebel, 286 Fifth Ave., New York.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)

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Sworn to and subscribed before me this 4th day of April, 1921. M. C. EBEL, Editor.

[Seal] CHARLES BENJAMIN,
(My commission expires March 30, 1922.)

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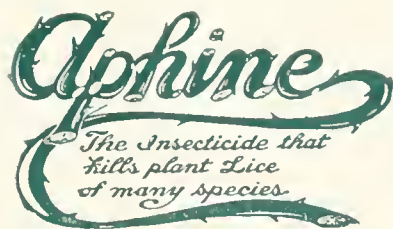
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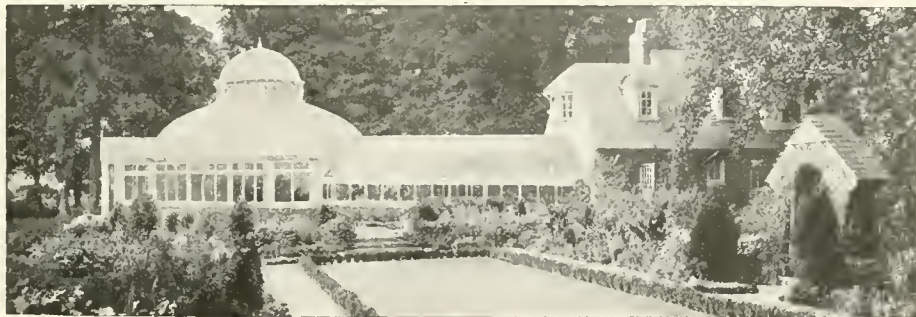
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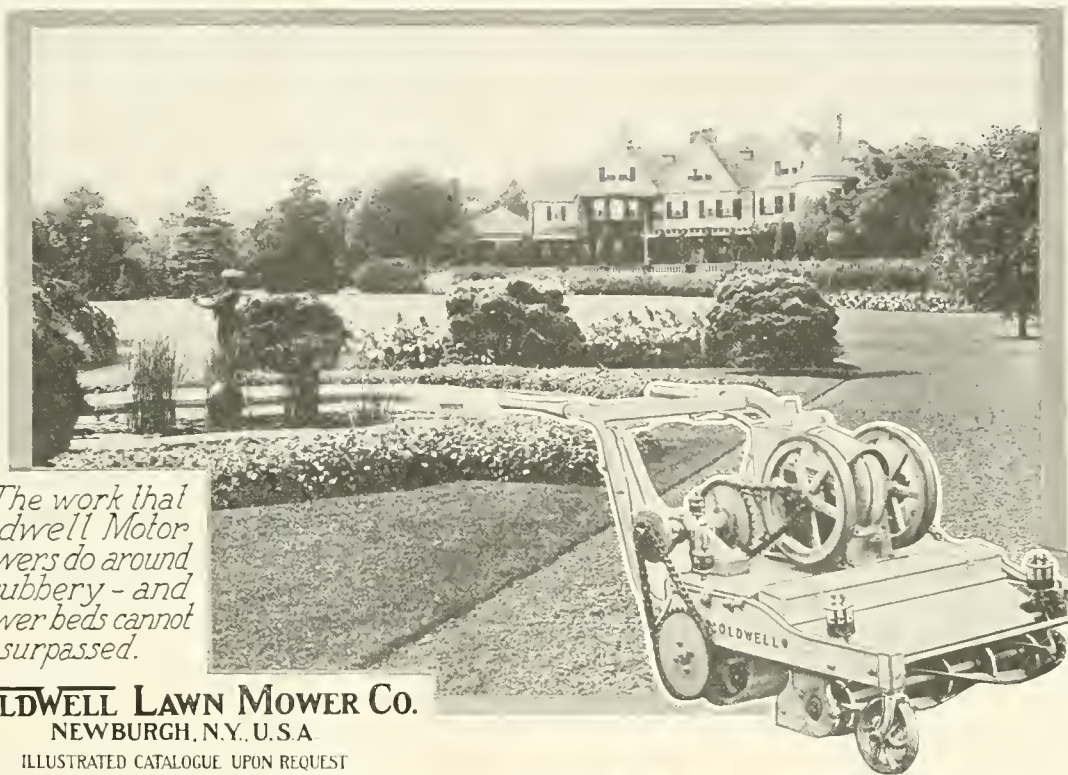
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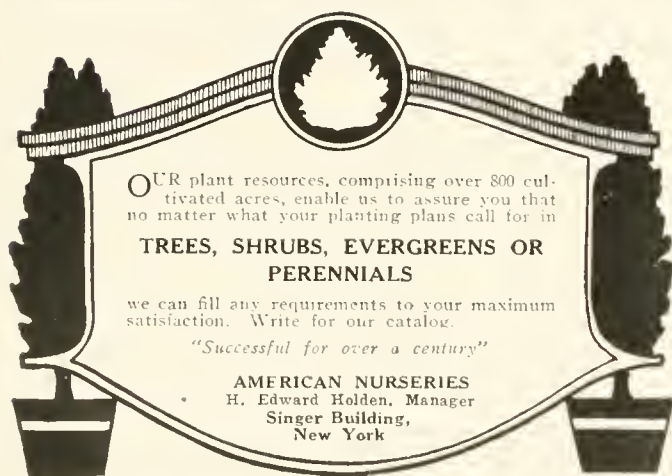
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

JUNE, 1921

No. 6

Things and Thoughts of the Garden

MONTAGUE FREE

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GARDEN

IT was our intention in last month's article to write in general of the lesser known rock garden plants, but the claims of the Saxifrages proved so important that other subjects received but scant attention. This result is not surprising when one considers the high position the genus *Saxifraga* occupies in the rock gardener's esteem and that its importance is so great as to cause it to be honored by the production of at least one book, "Saxifrages or Rockfoils," Irving and Malby, that is devoted entirely to this fascinating group.

With the rapidly growing appreciation of the value of the rock garden as an element in the garden landscape, it seems to be worth while to stop and consider whether the plant material generally used in its embellishment is entirely appropriate and whether it is not possible, now that we are feeling our feet so to speak, to utilize to a greater extent that class of plants, the alpinists, in whose behalf the rock garden first came into existence.

There is often a tendency, when planting a newly constructed rock garden, to use quick growing material that will serve to take away the awful barrenness, partially cover the rocks, and give an immediate effect. Thus we find the rock garden occupied to a large extent with *Alyssum saxatile*, *Arabis albida*, easily grown *Campanulas*, strong growing *Dianthus*, hardy ferns, perennial Candytuft, Forget-me-nots, *Phlox subulata* varieties, Houseleeks, and such—all of which are good so far as they go, and indispensable in a large rock garden. But we should not lose sight of the fact that the rock garden is intended as the abode of choicer material, and these strong growers should be definitely kept within bounds and not allowed to usurp positions that should be occupied by more appropriate plants. Which brings us to a consideration of what should be aimed at as the ideal in material for rock garden planting.

* * *

Farrar discusses the subject rather fully in his book "My Rock Garden" and seems to come to the conclusion, mentioned in last month's article, that anything may be planted in a rock garden that looks well there. This is a wide definition in all conscience and lays the whole problem on the taste of the planter. But it seems impossible, in a few words, to give a more satisfactory definition of what is, and what is not, admissible. The matter is altogether too complicated, for there are alpinists that are not rock plants, there are rock plants that are not alpinists, and lowland plants, neither alpine or saxatile, but which are eminently adapted to rock garden planting for cultural reasons, and because they look appropriate.

Some alpinists are unattractive and for garden purposes are merely "weeds" and some rock plants do not at all fit in with the general conception of what is considered appropriate in the rock garden. Therefore, we would say that in coming to a decision on a plant's admissibility, use Farrar's definition, but have in mind that preference should always be given to all alpinists that have pretensions to beauty; to beautiful dwarf or prostrate plants from arctic regions, which, in many cases, because of growing under similar conditions, are identical with or possess the characteristics of the plants above timberline. Furthermore, admit hardy dwarf plants that in Nature are found growing in rocky situations, giving preference to those that cannot be grown easily in the perennial border, and any other hardy plants that in their general appearance are similar to the two preceding classes and which demand the special conditions for their culture that it is possible to provide with ease in the rock garden.

* * *

If the rock garden is planted having in mind the above conditions and reservations it will involve growing many plants whose character is adequately expressed in the word, that conveys so much to the gardener's ears, "miffy." But should we be deterred from attempting their cultivation merely because they will not succeed when subjected to slap-dash, hit-or-miss methods? Surely not, for "fine" gardening in its larger meaning can never be accomplished if we restrict ourselves to easy doers as represented by such types as scarlet sage and Zinnia. We do not ask anyone to waste their time on such hopeless "miffs" as *Eritrichium nanum*, the name of which is corrupted by those who have attempted to humor its crankiness to "very tricky 'un," or on *Soldanella alpina*, which, although it thrives can never be induced to bloom, or on the Aretia group of Androsaces which even such a race of rock gardeners as the British, with a more favorable climate than ours, have difficulties with. But we do make a plea for the exercise of more discrimination in rock garden plantings and for the use of real alpine and rock plants in preference to those, which, though they may be of easier culture, are of coarser habit and unfitted to associate with the aristocrats of the mountains. It has been abundantly proven that alpinists, many of them, will succeed under our conditions—meaning those found in Eastern North America. Even here in Brooklyn, in the center of a dusty city, heat and wind alternating with heat and humidity in Summer, there are many that thrive, and I have before me a list of some of the choicer rock plants grown by Clarence Lown at Poughkeepsie which

is a sufficient refutation of the wail of the croaker that we cannot grow alpine. In this list there are about eighty species and varieties of *Saxifraga*, over forty of them belonging in the Encrusted section, and twenty in the "reckoned to be difficult" Kabschia group. There are ten *Androsaces*, half a dozen or more *Aethionemas*, a dozen *Campanulas* of choice dwarf types, more than a score of *Sedums*, and representatives of such typical alpine as *Dryas*, *Draba*, *Ramondia*, *Gentiana*, etc.

* * *

Merely to mention the lesser known species that ought to be considered indispensable in a well planted rock garden would take up far too much room, and, because of the supreme unattractiveness of a mere list of names, would probably defeat the purpose we have in mind—that of convincing the reader of the desirability of increasing the number of rightful occupants of the rock garden and the exclusion of arrogant interlopers. Therefore on this occasion a few only of the lesser known but eminently desirable kinds will be considered.

When the genus *Achillea* is mentioned the species that usually are the first to come to mind are *A. filipendulina*, and the *A. ptarmica* varieties—admirable in the herbaceous border, but, because of their rampant growth, anathema in the rock garden. Or we may think ruefully of that pernicious weed that thrives amazingly in lawns made on poor dry soil, *A. millefolium*, the Common Yarrow. But this is a large genus and includes many charming rock and alpine plants. The gem of the genus is *A. umbellata*, from Greece, which forms mats of deeply cut silvery leaves topped with white flowers five or six inches high. *A. argentea* is a similar species and *A. clareana* is a tufted species with ashy leaves and white flowers. The species usually sold as *A. ageratifolia* or as *A. ageratifolia* var. *aizoon* is not an *Achillea* at all but is correctly *Anthemis aizoon*. In spite of spending most of its time under an alias it is far from being an undesirable and is by many considered to be the best of the dwarf Composites with silvery leaves and white flowers. It has white leaves, very attractive, and useful for providing foliage contrasts associated with plants having leaves of bright green. Its flowers are large, produced in umbels arising on wiry stems about ten inches from the ground. The white, or whitish, centers of the flowers of the plants just mentioned cause them to stand out distinctly from the rest of the family whose disk florets are usually yellow or brown and but rarely white.

A dry sunny slope, well drained, is the best position in which to grow these hoary leaved plants. They bitterly resent wet feet and too much water over head. Although it is not always practicable to prevent the latter it is easily possible by providing ample drainage and porous soil to ensure the right conditions about their roots. A few years ago we suffered from ten consecutive days of almost continuous rain coupled with high temperatures and humidity. When the heavens ceased to weep our collection of *Achilleas* presented a sorry spectacle with leaves rotted and matted together, bedraggled and forlorn. But in spite of this ordeal, which worked havoc on many plants better able to endure such copious rainfall, we managed to save those of the *Achilleas* planted where super drainage prevailed.

The genus *Androsace* contains many species that are at once the joy and the despair of the alpine enthusiast. Joy giving because of their dainty, diminutive perfection, and despair provoking because of their abhorrence of our hospitality which is expressed by their prompt demise. Fortunately not all of them are so unappreciative of our efforts on their behalf. Some of the Himalayan representatives are easy. Our favorite is *A. lanuginosa*, partly because of its habit of blooming all through the Sum-

mer. It is a delightful plant with trailing stems, its leaves clothed with silky hairs, and flowers of rosy-lilac produced in umbels. There is a variety, *Leichtlinii*, which has white blooms with red or yellow centers. Cuttings, about two inches in length, made from the tips of the shoots, root readily if inserted in sand in a cold frame in August. Another species from the Himalayas is *A. sarmentosa*, which expends its blossoming energies in a burst of glory in May, with foliage almost hidden under a canopy, three or four inches high, formed of umbrellas of tiny pink blooms. This kind forms distinct rosettes and apes the strawberry in its habit of sending out runners. The European species most amenable to our conditions, if we except the annual, or biennial, *A. lactiflora*, is probably the charming *A. carnea*. Dwarf, with dark green leaves and flowers of white or pink, it should be in every rock garden where suitable cultural conditions, of well drained soil, porous and peaty, and partial shade, can be given.

The *Aethionemas* are sun lovers, mostly from the coastal regions of Asia Minor and Syria. The best species, although rather tall—about eighteen inches—is *A. grandiflorum*, which has somewhat glaucous foliage and spikes of rose pink flowers. Of the dwarf kinds, which attain a height of only a few inches, *cordifolia* and *pulchellum* are most desirable. These cannot be classed as alpine, but they are rock plants and really look as though they belong.

For the present we must omit any reference to desirable species in the genera *Anemone*, *Aquilegia* and *Arenaria*, and proceed to a consideration of the *Campanulas*. There is an embarrassment of riches in this genus, and from a list of about sixty species suitable for the rock garden, it is somewhat difficult to single out two or three for special mention. The nodding, pale blue bells of *C. caespitosa* on slender stems, four to six inches high, should be seen in every alpine garden. It is closely allied to *C. pusilla*, of which there are many garden forms. *C. portenschlagiana*, of catalogs, whose blue flowers huddle near its bright green foliage, shows its preferences by hugging the rocks and traveling by means of underground stems into every accessible cranny. It is about four inches high. One of the very distinct Bellflowers is *C. pulloides*, supposed to be a hybrid between *C. pulla* and one of the *carpatica* forms. The mixture has endowed it with a strong constitution and it is one of the best, and easy to grow. Its foliage forms a mat close to the soil, surmounted by shining blue-purple flowers on six-inch stems. We have raised from seeds and have blossomed in the moraine in Brooklyn, the rare *C. Allionii*, but the plants died after flowering. To get an idea of the appearance of this typical alpine, one should imagine an individual flower of a Canterbury Bell of slaty blue coloring, supported on a stem three inches in length, springing from a tuft of leaves about two inches in diameter.

Of the hardy Pinks there are two that every rock gardener should strive for—*Dianthus alpinus*, a dwarf species with red flowers spotted with crimson, almost as large as a half-dollar, and *D. neglectus*, the Glacier Pink, another pygmy, which has bright pink flowers with the undersize of the petals of glistening buff. Most of *Dianthus*es are acceptable rock plants but these two are the best of the genus.

The genus *Linaria* contains several plants of interest to the rock gardener but two stand out above the rest. One, *L. alpina*, is a frail beauty, that deserves all the coddling that it usually requires, but the other, *L. hepaticifolia*, although it has some pretensions to beauty, can only be considered as an execrable weed because of

(Continued on page 607)

Carnations and Pinks

DR. E. BADE



Dianthus Chinensis



Dianthus Barbatus

CARNATIONS are old friends of the lover of flowers. They are found under all sorts of conditions; are present in the formal garden, in the home garden, in the garden of the farmer, and even in the window garden of the tenements. Their home is the vicinity of the Mediterranean Sea, where they have developed into simple and compound flowers. Even at the time of the ancient Greeks they were cultivated as pot and garden plants.

That carnation with its flowers in clusters finds its home in the southern parts of Bavaria. It has long been cultivated and is known as the "Sweet William." These hardy plants are generally treated as biennials. The seeds are sown directly upon the beds or in the cold bed in June and transplanted in August when they are placed half a foot apart. Flowers will appear in the second year. They are easily cultivated, and do well under almost any condition. No special type of soil is required and they even flower if standing in a light shade. The plants never come true to form when propagated from seeds, and in the third year they lose much of their beauty and become scraggy.

Dianthus plumarius is another hardy carnation having

both simple and compound flowers which exhale a sweet odor. These plants are also treated as biennials in the garden; are easily grown from seeds, and can also be propagated through cuttings like the garden carnation. The seeds are either sown in March in the hotbed, or upon the beds directly in June. The plants are usually placed at half a foot intervals. It is also possible to propagate through division. Here the different parts are sunk into the soil to a greater depth than the plants originally stood in order to force the long shoots to form roots. Old plants can be regenerated by judicious pruning. This carnation does best in a clay soil.

There are some recognized varieties of this species which are very beautiful. They have the characteristic property of producing flowers which at first appear to rise straight upward but, with the development of the buds, they begin to lean and later droop downward. These plants must be transplanted in the Fall and brought



Dianthus Plumarius

to a frost-free place for the Winter. During this period of rest they require but little water.

The Chinese carnation, *Dianthus chinensis*, is a Summer carnation. It is odorless, but this lack is made up by the delicate color scheme of their flowers. As a rule, they are compound with the leaves on the flower stalk more or less slit. The garden hybrids, the Heddewig carnations, are more simple in design and show well developed color demarcations; are more robust than the original species, and the leaves are either entire or but slightly serrate. Forms have been developed with compound flowers and slit leaves but they are less beautiful. Other good varieties of this species are the dwarfed (*Nana-*) forms.

The original flowers of the Chinese and the Heddewig carnations are never reproduced by cuttings. The seeds are sown in boxes during the month of April and the flowers begin to open in June and last until late in the Fall. They can be sown in the open in the month of May, but under these conditions they will, of course, flower at a later period. They are placed at a distance of a half a



Dianthus Heddewigii

foot when transplanted and desire a sunny spot containing a rich clay soil. Seeds can also be sown in July or August and the seedlings transplanted in the Fall. During an open Winter it is advisable to protect the young plants from frost.

The true carnation is the garden carnation, *Dianthus caryophyllus*. This is a beautiful garden plant whose flowers appear in the most manifold shades and tints of shiny bright colors. They also exhale an exquisite delicate odor. In form they are various; some are simple, others compound, with one or with many colors; some are high, and others are dwarfed.

These plants can be cultivated both in flower pots and in the open, where they are usually found to be hardy. Propagation is generally effected through seeds which are sown in April or May in boxes, pots, or in the cold bed. The seedlings are transplanted, with the soil attached to their roots, to reserve beds from which they are again transplanted in the Spring, about three-quarters of a foot apart, to beds upon which they are to flower, since the principal period of flowering is its second year. In the third year these plants produce long stems with few flowers.

If it is desirable to keep a certain variety of these plants, then cuttings must be made. For this purpose, long, slender, and flowerless shoots are selected. These are bent downward into the soil, hooked in place and covered lightly with soil so that the tip and the upper leaves project upward. At this time the soil of the carnation bed is loosened, and the soil fertilized. The shoot to be

used for propagation is held in the left hand, and with a sharp knife, a slit is made from one node to another. This forms a so-called tongue. At the place where this shoot is found, the soil is loosened; the cut part inserted in the soil, hooked in place with a tiny twig so that the tongue remains horizontal, and the hole covered with soil.

The shoot so placed in the ground is still connected with the mother plant which provides it with food. At the end of about six weeks it will have formed a good root system at the cut place. Then the plant can be cut from the mother plant, and treated as a new plant. It is advisable to plant this shoot in a flower pot, leaving it out of doors as long as possible, and bringing it into some frost-free room or placing in the cold bed over Winter.

If it is impossible to propagate in this way, shoots can be cut off and planted. For this purpose it is best to take shoots which are strong and healthy and bear at least two to four nodes. The lowest node is cut exactly in half. The lowest internode is then split in exactly four equal parts, and the pith removed with a sharp knife. The so prepared shoot is either placed in the cold bed or in a flower pot so that one or two nodes are covered with soil. If a flower pot is used it should be covered with a glass plate. When placing the shoot into the soil, be careful to spread the cut parts horizontally. The soil is then gently pressed into place, and the tip of the leaves are cut off. Until roots are formed the plant must be kept well shaded and moist. In both of these methods of propagation, flower buds should not be allowed to form until the plant has made roots.

June Birds

PAUL B. RIIS

THE birds are now more nearly stationary than any other month in the year. After the early days of June all birds are either Summer residents or permanent residents. June is the important month of reproduction and the time is fully given over to nest building, egg laying, incubation and raising of the young. Mating and nest building are the culmination of incredible long flights from and to the nesting grounds which complete the cycle of migration. The full development of the bird's year has now been reached.

With the leafing out of the foliage it can be observed that the birds find ample security and seclusion for their nests further out on the branches, the early builders all seeking the protection of tree trunk and crotch. The bronzed grackle has completed its only brood and the birds are forsaking their nesting grounds for the communal roost in groves or woods. Robins and bluebirds are engaged in building their second nest while the later arrivals are yet to begin their household duties. Among the June nest builders may be noted the night hawk, whip-poor-will, scarlet tanager, Kentucky warbler, crested flycatcher, wood pewee and cedar waxwing. Occasionally the purple martin delays its period of incubation until early June.

To him who delights in the out of doors at early dawn is given the rarest entertainment in bird melody. The morning chorus, prompted by the mating instinct strong within, is full voiced, competitive and animated. It is due to their ability to sing that the birds make their strongest appeal to us. Their carefree song gives us pleasure and imparts a spirit of happiness. Yet it is not generally understood, that song plays a more serious and important part in the bird's life than that of entertain-

ment. Our foremost authorities are agreed that it is not the outpouring and overflowing of a happy heart, nor an expression of ecstasy in the joy of life. Neither does the repertoire appeal to the performer for art sake. Its functions are believed to be of a secondary sexual character, attaining its fullest expression during the nesting season. Confirmatory is the fact that song ceases almost entirely at the expiration of this period. The brown thrasher, the mocking bird of the North, rarely sings a greater period than six weeks. However, the molting season closely following incubation is a period of physical depression. This, others point out, is the real cause for the cessation of song, which after complete convalescence is again indulged in to some extent. Few have inclined toward this new theory. John Burroughs expressed his belief that the song of the male was intended for the ear of the mate and its origin to be found in the male sexual principle. Song is practically restricted to the male bird with a few exceptions, notably that of the rose-breasted grosbeak and cardinal, the females of both species singing in a limited way.

We find further delight in the vari-colored plumage of birds. The tints varying from modest gray to the brilliant splendor of tropical hues are at this time attaining their brightest nuptial color. Here it is easiest to identify our friends, correctly and conspicuously garbed in gala attire. Dame Nature also decreed that these colors should serve the male to attract a mate. Instances, such as that of the egret with its nuptial plumes and the lyre bird with its elaborated tail which it judiciously displays to win favor with the female, may indicate that the plumage also takes on a secondary sexual character.

In your patience ye are strong.—Mrs. E. B. Browning.

Annual and Biennial Plants—Some of Their Uses

ROBERT CAMERON

(Continued)

BIENNIALS are not as numerous in species and varieties as annuals. Though they are few in number, some of them are handsome old-fashioned plants.

Hollyhocks, probably the most popular biennials we grow, have been greatly improved within recent years and are the noblest of garden plants. They are subject to several diseases and owing to this, many people have been discouraged in growing them. One of the worst diseases attacking these plants is a rust that destroys the leaves and can be held in check by spraying with Bordeaux Mixture. There are both single and double forms. The single kinds, with the exception of those with purple flowers, have pleasing colors, and are more thrifty and less liable to disease than the double forms are. The double hollyhocks, when grown well, are exceptionally fine and during their flowering period, are so stately that we have no plants to compare with them. To get good healthy plants and to have a stock of young material always on hand, seeds should be sown each year. The usual time to sow the seed is in June or early in July, and if given liberal treatment, they will make large plants before Winter begins. A dry position where no water will lodge about them is a very favorable location in Winter. A slight covering with coarse straw or salt-marsh hay is beneficial. However, if one has a cold frame, it is the best place for the young plants to Winter. Whenever the frost is out of the ground in Spring, they may be transplanted into deep, rich soil where they are to blossom during the following Summer. There are annual varieties catalogued which produce fine flowering plants the first season. Any variety of hollyhock will flower the first season, if the seed is sown in the greenhouse early in January and grown along in a moderately warm house. Young plants grown in this way are less liable to the attacks of fungous diseases. Hollyhocks make fine material for planting out-doors as they blossom profusely during Summer. For backgrounds to large borders, grouping on lawns, or for distant effects, the hollyhocks stand unrivalled.

Canterbury Bells are handsome, decorative plants and when in bloom, are profusely covered with large bell-shaped flowers which make a most brilliant display. The seeds should be sown in July and when the weather is very severe, the plants may be kept over the Winter in cold frames. If they are grown out of doors all Winter, a slight covering of hay is most helpful. These flowers can be obtained in single and double forms, and cup-and-saucer varieties. The colors most prominent in the single flowered varieties are rose, mauve, blue, white, and striped. In double flowered varieties the most pleasing colors are blue, white and rose. The cup-and-saucer forms are much more showy and have many colors, the white-flowered and pink-flowered kinds being the most effective. They are good border plants and when grown in large masses, are highly decorative. When grown as pot plants, they make handsome specimens and are especially valuable for conservatory or piazza.

Sweet Williams are old-fashioned plants and, although we have many fine colored varieties, there has not been so much improvement with them as with many other plants. To obtain good flowers very much is dependent on the strain of seed. The finest strain we know is Sutton's; their Pink Beauty and Sutton's Scarlet are two excellent

kinds, as are also their Auricula-eyed and self-colored varieties. The double flowering kinds, though they have some splendid colors, are not as pleasing as the single-flowered forms. Of course, old plants can be preserved by growing them in extra favorable places and increased by division. The best results are obtained by treating them as biennials, for they will then bloom more abundantly and more evenly. To have good sized plants, the seeds should be shown in April or May, to blossom the following Summer. Sweet Williams enjoy a strong, rich soil and a position where water will not lodge about the crowns of the plants.

Wallflowers are not grown as much as they should be, for we have no flower in early Spring that has such a delicious fragrance. If the seeds are sown in April or May, the young plants may be planted out for the Summer, and put in cold frames during the Winter. In Spring, they make attractive beds, and although the flowers are not as showy as those of some other plants, this deficiency is made up by their sweet fragrance. There are several single and double forms, the single flowers being the most fragrant. The Parisian annual variety, which was introduced a few years ago, if sown early in Spring in the greenhouse, will flower the first Summer.

Foxgloves or fairy thimbles, *Digitalis purpurea*, are sometimes perennials, but when we want them for massing effects we grow them as biennials, as they flower more evenly. In some situations they are not hardy and are benefited by a mulch in Winter. The seeds are sown in Spring and grown out during the Summer, producing their long flowering stems the next year. They make excellent border plants and are also good for semi-wild effects. The kind known as *Digitalis gloxiniflora* is the most striking. Foxgloves are sometimes grown in pots for conservatory or piazza decorations.

Honesty, *Lunaria biennis*, is a biennial which has rather showy purplish flowers. It is not altogether for the blossoms that this plant is cultivated, but for its silvery-white seed pods which are used in Winter bouquets. It is called Honesty because the seeds can be seen through the pods. If the seeds are sown in Spring, the plants will blossom the following year.

The English daisies, although a perennial in Europe, give better results in this country when they are treated as biennials. If sown in August and wintered over in frames, they are useful for borders or beds.

Pansies give better results when treated as biennials. They are generally sown in August and by Spring they make strong, stocky plants.

The forget-me-nots which are also treated as biennials, are especially easy to grow. They are always pleasing and can be used in many different ways.

Plants are just like the paints that an artist uses, they may be used right or wrong. Now, what are you going to do with them? The material I have placed before you contains every shade of color. In themselves these plants are beautiful but it is up to the gardener to make attractive garden pictures.

I have read in my day practically every book and good magazine article that has been written on annuals. Every one of them gives a long list, but as to how to use this material, you acquire no more knowledge than what you had before reading. Over twenty years ago I read a paper on annuals before this club and like everybody else, I only mentioned a very few ways of using them. Well,

do I remember Mr. Temple of Shade Hill Nurseries asking me about making pleasing pictures of annuals. You can see there was a dearth of knowledge then as there is today and it is right at this point that the gardener needs assistance.

Before we begin taking up the color schemes for annuals, let us consider for a moment the garden design. Although flowers and plants are the principal things in a garden, yet they do not make a garden as a whole. To secure a pleasing garden the first requisite is to have a pleasing design or plan. A garden may possess the finest plants and an abundance of flowers, yet it is a failure if the design or layout is poor. Some gardens, although named so, are not gardens, but merely a lot of flower beds. In other places the so-called garden is a border of plants. Sometimes it is not the gardener's fault, but the fault of the landscape gardener or architect who has given him a poor layout and hence the reason for his failure. Other gardens are failures because they have too many flowers in them. One of the most beautiful things in a garden is a carpet of green grass. If it is not beautiful, why did Nature plant it so lavishly everywhere? The most delightful and refreshing color in the world is green. I like a garden that has plenty of grass to walk on, where one is not afraid that he is trampling on flowers all the time. To enjoy a garden one must feel at ease, and in a hampered garden there is no comfort or repose. The location and surroundings of a garden are important factors which have much to do with making a garden that is attractive and satisfactory. The grouping of plants and the color schemes may be most charming, but if the other things that I have mentioned are not satisfactory, then the garden as a whole is not a success. A garden design ought to be as simple as possible and should not exhibit any kind of scroll work. That is, the garden should be as natural as possible even though it be an architectural garden. One other thing that is distasteful, and is very common in our American gardens, more especially in our larger gardens, and that is, the gardens are cluttered all over with large bay trees. They have their uses but not in the garden. This is a subject that could be extended and elaborated so that we could spend a whole evening, but I have said enough to show my viewpoint of a garden plan.

COLOR SCHEMES WITH ANNUALS AND BIENNIALS

There are two ways of arranging plants in bloom. The first is to arrange according to contrast. Examples of contrast are black and white; red and green; orange and blue; yellow and indigo; green and reddish violet; blue and orange; indigo and orange yellow. There are intermediate shades but just as they approach the above colors so must the rules of contrast be applied. In planting gardens nowadays there is not as much done with contrasting colors as there was in the days of bedding plants. Yet this can be said, that if there is a lot of green foliage, it softens down the harsh colors and contrasts are more pleasing. Most flower gardens are arranged according to the law of harmony. Colors are said to harmonize when different shades blend insensibly into each other.

It is not enough for a gardener to know the name of the plants he is going to use. He ought also to know the heights, habit and the color of the flowers and foliage. He also should have good taste so as to arrange the various plants that the flowers and habits of the plants will group together to make a pleasing composition. Two gardens may contain the same number and kind of plants: the one may be planted in such a way that everything is jarring, displeasing and unrestful, while the other garden may be planted in such a way that it makes an im-

pression of pleasing satisfaction. In forming plantations of flowers, the right thing to do is to place the plants so that they will form a part of a harmonious whole. When planting groups, one ought to view them from different parts of the garden so as to see that the arrangement is excellent from all points. Another important thing to bear in mind is not to plant too large masses of annual plants because when they are through flowering, they leave too large a gap which must be filled up with some other plants.

A garden to be successful should have continuous bloom from May until the end of October. It is no easy task to accomplish this, and requires a lot of planning and scheming to keep a garden bright for this long period. However, it can be done if a person has the equipment. One of the things necessary is a good number of cold frames where lots of annuals and biennials can be grown in pots to be planted in the vacant spaces as they occur. Another essential acquisition is a nursery or reserve garden where annuals and biennials can be grown, and lifted and used in the garden as required. When lifting plants from the reserve garden, do it while the soil is dry. If they are watered before they are lifted, they are more liable to wilt. Water them at once when they are put in their place in the garden and they will draw up the water into their stems.

One ought not to forget that certain annuals must be sown two or three times during the Summer to keep up the succession of bloom. Another most important point to remember is that all seed pods and faded flowers should be removed daily, indeed this is so important that if it is neglected the continuous bloom will be a failure. As an example, and to show how important this work is, last Summer the Canterbury Bells we had in our garden were gone over each morning and the seeds and old blossoms picked off. In doing this we obtained three crops of flowers from our plants and had them in bloom up to the beginning of August. Now there are certain plants that it would be useless to waste the time on, for instance, foxgloves, because there are no reserve flower buds to develop the second lot of flowers. There are other plants that when the old flower stem is cut away throw up another lot of flower stems. Though inferior to the first flowering, however, they help to keep up the continuous bloom. There are scores of other little details which seem trifling but when attended to they help to make the garden a success.

COLOR SCHEMES IN THE FLOWER GARDEN

Let us begin with the Spring garden and take a few examples. The annual plants to be used in the Spring ought to be raised from seed the previous August and should be well-grown plants which ought to flower in about two weeks after planting. Lovely combinations can be made with tulips and annual plants. Spring flowering annuals serve three purposes: first, they make a pleasing combination; second, they cover the ground in the beds completely, and, third, they continue to flower for some time after the bulbs are through blossoming. In planting beds of bulbs, the planting of annuals should not be done until the tulips or other bulbous plants have pushed up their new growths about three inches above the ground, then one is not liable to disturb them. Darwin tulip, Clara Butt, which is soft salmon pink, makes a most pleasing effect with groundwork of white English daisies. The Darwin tulip, Gretchen, makes a very pleasing bed with the pink and white English daisies. Darwin tulip, Pride of Haarlem, goes well with a rather dark pansy.

The cottage tulip, Picotee, which is white margined with cerise makes a charming bed when *Myosotis*, Royal

Blue, is used. This is one of the best of the *Myosotes*. There are several varieties of forget-me-not that are practically useless for bedding because they grow so flat and have no grace to them. Royal Blue grows to a good height and is light and airy and the flowers are of a deep indigo blue color. A mixed bed of tulips where the colors harmonize well with mixed pansies makes a good groundwork and an attractive bed. Beds of daffodils I like better without any combination of plants. However, the Poet's Narcissus makes a delightful combination with forget-me-nots or English daisies. Very fine beds can be made, which are loved by all, with large masses of forget-me-nots. English daisies makes a pleasing mass of color. *Viola cornuta*, both blue and white, makes good beds. Self-colored pansies are charming and nothing is more pleasing than the variety, Lord Beaconsfield. *Silene pendula* makes a very pleasing pink bed.

Then the herbaceous border where bulbs are planted for Spring effect requires annuals to fill up the gaps when the bulbs die down and to help to carry on the continuous bloom during the Summer and Fall months. At the back of the border where the tall plants grow, the larger growing annuals should be used, such as cosmos, pink and white, *Nicotiana sylvestris*, *Tagetes*, zinnias, *Salpiglossis*, and many others; for nearer the front of the border such plants as asters, stocks, *Browallia*, *Torenia*, candytuft, snapdragon, *Gypsophila*, *Nigella*, *Verbena*, *Clarkia*, and *Godetia*. Care should be taken that the colors of the annual flowers will harmonize with those nearer them.

ANNUALS FOR CONTINUOUS BLOSSOM IN THE FLOWER GARDEN

This is a subject that really requires much more time than I can give it now. However, it is astonishing the brightness and quantity of blossoms annuals and biennials give during the Summer and Fall months. In using these annual plants care must be taken in planting them that those used should harmonize with the hardy perennials which are used in the color scheme. For continuous bloom I use three kinds of plants in clumps of about two feet across. For an example, take *Lilium candidum*, tall, white snapdragon and blue *Ageratum*; further along a clump of Canterbury Bells, pink shades, pink snapdragon and white *Ageratum*; and further along another clump of foxgloves, probably with white flowers, pink snapdragon and pink *Verbena*. In the centre of the large long beds in our garden last Summer we had great success with sweet peas grown in clumps on birch branches. They blossomed up to September by picking the old blossoms and not letting them go to seed. The kinds that gave the most satisfaction were Constance Hinton, white; White Spencer; for pink, Edrom Beauty, Hawlmark Pink; Captain of the Blues Spencer, Lord Nelson and Imperial Blue. These were planted so that they would harmonize with the other tall plants in bloom at that time.

Canterbury Bells and foxgloves are the two best biennials to use in Summer gardens and with them wonderful effects can be produced. When these are over we replace them with plants which have been grown in pots. *Hyanthus candidans*, *Lilium auratum*, *L. speciosum album* and *regale* make up combinations of annuals, whose flowers will combine with the above plants. Then about the beginning of September the plants in the reserve garden are put into use and there are none better than the China asters whose colors are so pleasing. Cosmos, the white and pink flowered kinds, lift easily at this time and are used to fill vacant spaces among the taller plants. About the beginning of October single flowered and pompon chrysanthemums of suitable colors, which

are grown in pots, are used liberally. They will present a fine show until November if there is no hard frost. We had plenty of them up to November 12th last Fall.

We use no red and very little yellow in our garden. Blue colors we employ most; then, pink. White flowers are used liberally. If one uses red and yellow sparingly, color harmony is quite easy. One of the finest color effects I saw last year was a wall covered with the rose, Dorothy Perkins, and just in the spaces where the rose plants joined there were tall spires of double pink hollyhock and in front of these were lots of *Lilium regale* and in front of the lilies, pink and white snapdragon, *Nemesis*, *Lobelia*, pansies and Sweet Alyssum.

There is no kind of beds or effects that are wanted but can be produced with annual plants. For subtropical effects such fine foliage plants as *Ricinus*, *Amaranthus* the various varieties, *Cannabis gigantea*, *Cosmos*, *Helianthus* of different species, *Nicotiana suaveolens*, *sylvestris* and *tomentosa*, *Solanum atropurpureum*, *pyracanthum* and *Warszewiczii*, *Malva crispa*, *Pennisetum longistylum* and *Ruppellianum*, *Zea gracillima variegata*, *Japonica variegata*, and many others that could be mentioned.

At times one wants some cheap plant for a temporary screen to hide something that is undesirable to look at. There are no plants that grow as quickly as annuals and if selected right they are quite satisfactory for this kind of work. Probably there are no plants cultivated that give such a beautiful hedge effect as sweet peas. *Ipomoea purpurea* is especially good for covering trellises and so the are tall nasturtiums, *Tropaeolum majus*. *Cobaea scandens* has beautiful foliage and grows quickly and covers a large space during the Summer months. Scarlet runners are especially good for this kind of work and are both beautiful and useful. Gourds, especially those with small fruits are well adapted for covering trellis work and are always interesting. Most of the kinds mentioned for subtropical effects are good for temporary screens.

Beds or masses of sweet scented annuals are always enjoyed in the garden. Most of these plants are more fragrant in the evening and many enjoy their gardens at that time. Some of the most fragrant annuals are stocks, mignonette, the white tobacco—*Nicotiana affinis*, which is a lovely plant, and no garden should be without it. Sweet Alyssum is especially good.

BEST KINDS OF ANNUALS FOR CUT FLOWERS

If a large quantity of cut flowers is needed a separate piece of ground should be laid aside for this purpose. Such a piece of ground should be dug and well manured in the Fall so that the ground will be in good shape for planting the annuals in Spring. Just before planting the ground should be dug over again and given a good liberal coating of bone meal and this should be enough to carry the plants through the Summer.

Sweet peas are probably the most free flowering plants grown and there are more of them grown than of any other annual. They need a good deal more attention and soil preparation than any of the other annuals, but there are no plants that pay so liberally for the extra care and work. China asters are also good, especially all the long stemmed varieties. Other good kinds are *Centaurea cyanus*, *Centaurea imperialis*, snapdragons, *corcopsis*, *cosmos*, mignonette, stocks, larkspur, lupins, poppies, *Browallia*, chrysanthemums, *Gaillardia*, *Helianthus* (small flowered kinds), *Himmelmanna*, *Schizanthus*, *Scabiosa*, *atropurpurea*, candytuft, phlox *acroclinium*, *Helichrysum*, *Tropaeolum* and Zinnias.

The man whom I call deserving the name is one whose thoughts and exertions are for others rather than himself.—Sir Walter Scott.

Plant Distribution

WILLARD N. CLUTE

A DISPOSITION to move from one locality to another seems characteristic of all living things. Man himself is a good illustration of this fact, for his spirit of unrest among familiar scenes has prompted the more venturesome to explore distant lands, inspired the fisherman, hunter, and student to ramble nearer home and sends all of us away on at least two weeks' vacation. Possibly it is this spirit, also, that inclines a great number to change residences annually.

The migrations of birds are the most conspicuous examples of change of locality in the animal world, though of course it is well-known that many fishes regularly migrate and that the habit extends to various mammals. The annual movements of the great herds of buffalo which once peopled the western plains are now but memories, but the fur seals still have their migrations, and many other illustrations will be recalled, including such annual excursions as the garden toad makes to the nearest pond for the Spring mating. These expeditions, however, differ from the changes first referred to in that migrating forms ultimately return to the place from which they came. There is to be distinguished from this a movement away from the common center which results in colonization and permanent occupation of regions far from home.

There are few plants that make regular migrations, though the habit is not entirely absent among the simpler forms, but in the wider field of exploration and colonization, plants are second only to man himself. One of the chief incentives for man to move into a new region is the chance that he may better himself by so doing, and this seems to be the main advantage in plant movements. The two differ in this, however: man moves as an individual; the plant as a species. The latter cannot go itself, but it sends its children. No living thing is completely adapted to its locality; it does the best it can under the circumstances. When the chance to occupy a new locality presents itself it may often do much better by moving into it. Our wild plants afford many illustrations of this truth. They may be obscure and harmless in the region in which they are native, but transported to new countries they may become pestiferous weeds. The career of the prickly pear in Australia, of the Russian thistle in our semi-arid West, of the orange hawkweed, the oxeye daisy, the buttercup, and the Canadian thistle are good examples. All indicate that the region in which a species originates is not necessarily the one to which it is best adapted.

Unless the situation in which a plant finds itself is decidedly favorable it can never become a weed there. It may, and often does, find a region distinctly unfavorable and may fail to get a root-hold at all. The problem is further complicated by the fact that in ordinary situations all the available ground is already occupied while multitudes of seedlings, native to the region, annually spring up to compete for the places left vacant by the death of other individuals and to endeavor to overcome the least aggressive of those still living. Well established plants often find themselves hard pressed by such circumstances and it is no doubt fortunate for them, or at least for their race, that they are equipped with various devices for moving elsewhere.

There are certain associations of plants here and there so adjusted to soil and weather and to one another as to render the chance for a new plant's getting in extremely small. Such associations have usually lasted a long time

and have reached their present state only after a vigorous struggle in which all weaklings were ousted. In other places, however, this nicely balanced arrangement may be unsettled by various natural causes and thus offer an invading species more hopes of success. A landslide, for instance, may carry down into a valley all the plants over a considerable area and thus throw that region open to settlement. Moreover, the soil and rock carried down may dam a stream and form a lake or pond which drowns out the original inhabitants but forms a congenial home for water plants. Lakes are constantly being filled by earth and leaves washed into them or drained by streams cutting down their outlets. Rivers in flood gnaw away the banks in one place only to deposit the material in another in the form of sand-bars, islands, deltas or flood plains. Man, himself, has extensively changed the face of Nature by filling, draining, burning, logging, quarrying, mining and the like. All these afford new regions for colonization. Most serious of all from the wild plant's situation, are the operations of the farmer which remove whole floras to set new plants in their stead. Incidentally very extensive opportunities for colonization are presented, but they can be taken advantage of by only the most aggressive of plants, that is, the weeds.

When plants spread into a region that for some reason is thrown open to a new population, the first species to spring up, as might be expected, are those with wind-borne seeds. Plants with juicy fruits commonly follow and those with burs and nuts come last. There is also a regular order in the plants themselves, the first comers being largely annuals and biennials. Herbaceous perennials are somewhat slower to invade a region and the shrubs and trees are slowest of all. It may be said, however, that the first plants in a region are not necessarily those capable of holding it. It requires a certain amount of persistence to win, as in other walks of life, and the slower growing perennials ultimately prevail. There are many cases, also, in which plants may spoil a locality for themselves and yet make it favorable for others. In a cat-tail swamp, the accumulation of dead vegetation may finally produce a soil that other plants can take and hold. In nearly every locality one may find indications of one group of plants giving way to others.

There are few plants lacking in some special means for moving from one locality to another, but any of these means may fail to function in certain situations. Thus it is that many plants able to thrive in a given region are yet unable to reach it by reason of barriers of one kind or another. To woodland plants, a wide area of grassland or desert would be an insuperable barrier, just as the forest would be a barrier to grassland species. High mountains may prevent plants which cannot endure the cold from passing and at the same time may offer a route along which northern plants may spread far southward. Thus we see that what is a barrier to one species is not necessarily a barrier to another. The sea is an unusually effective barrier to the spreading, not only of plants, but of animals, and has often been depended upon to protect one country from the injurious species of another. This has not, however, prevented many European weeds from invading territory, nor will it entirely protect us from others.

What men want is not talent, it is purpose; in other words, not the power to achieve, but the will to labor. I believe that labor judiciously and continuously applied becomes genius.—*Selected.*

Oriental and Iceland Poppies

RICHARD ROTHE

DURING the latter part of May and the first half of June, the Oriental poppies represent a conspicuous color note in the floral aspect of the garden. A few warm days and the large, green egg-shaped buds bursting bring to light the intense shades of fiery red, orange, scarlet, crimson, maroon and more recently also white and beautiful salmon pink masses of huge flowers, which for strong near and distant effects prove invaluable. It is the festive jubilant brass tone of cornet and trombone in the great color symphony of our herbaceous gardens. We have seen those large silky, lustrous petals time and again, but their beauty exerts its charm anew every ensuing season. In character it is fleeting—oriental, hailing from the land of wonders of Arabian

us that Spring is swiftly approaching. As a result of gentle southern breezes, we may see our Iceland poppy bed literally aglow with the brightest tints of white, sulphur, deep yellow and orange red. Light frosts seldom prove seriously injurious to flowers of *Papaver nudicaule*. Their stems are long, thin and wiry, bearing their blooms very well both in the garden and in a cut state in the vase or bowl on our table.

Papaver nudicaule, while classed among perennials, is usually better treated as biennial. Sowing the seed in early Spring enables us to raise a fresh supply of young, strong plants of uniform size for the following year. Like most of the poppies, they do not like to be transplanted while in a growing condition. It is for that rea-



Papaver Nudicaule



Papaver Orientale Mary Studholme

Nights, the land of flowery language and gay colors in apparel. Oriental poppies are indispensable inmates of American gardens. Being familiar with their habit of growth, we are aware of the withering and gradually drying up of the otherwise highly ornamental foliage during Mid-summer. To avoid unsightly bare spots on the border, gladiolus bulbs planted between, near and around oriental poppies prove serviceable. In the Fall when the gladioli have finished flowering the new ground foliage of the poppies appearing at that time finds sufficient light and air for normal development.

Of the bright red varieties, *Oriflamme*, *Trilby* and *Goliath* are known to be robust growers and very floriferous, while as leaders in salmon pink we note *Mrs. Perry*, *Princess Victoria Louise* and *Queen Alexandra*. *Perry's White* is distinguished by pure satiny white petals with a crimson maroon blotch at their base.

Propagating oriental poppies true to name and color of varieties is only possible by root cuttings or divisions. The proceedings in raising stock from seed during the early part of Spring are so well known that we need not dwell on it again.

South of New York, sometimes as early as in March, around Boston in April, along the sea coast of Maine and the southern part of Canada in May, the Iceland poppies begin to open their nodding dark green masses of buds. Hardly has the Winter cover been removed when the pinnate, glaucous foliage, which so far had been lying flat on the frozen ground, commences to rise and within a few days as a compact green tuft reminds

son advisable to establish and over-Winter plants where they are desired to bloom the coming Spring. Iceland poppies no doubt add effectively in strengthening and beautifying the vernal aspect of our gardens and home-grounds.

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 600)

its subterranean aggressiveness. It should be rigidly barred. The first named is entirely different. With its slender stems clothed with succulent, glaucous leaves and flowers variable in color but usually of orange and violet, it always commands attention. But, unfortunately, its constitution is far from robust. With us it is best treated as an annual, although in favorable positions it may persist for some years as a perennial.

The dainty little Alpine Poppy, *Papaver alpinum*, is worth the extra attention that its cultivation demands. If you can imagine a miniature *P. nudicaule* you will have a good idea of its fragile loveliness.

We must skip the Primulas, the alpine species of which we know all too little of in this country, and pass on to the Buttercups. There are two species whose presence should be striven for, namely, *Ranunculus montanus*, about five inches high, with none of the coarseness usually associated with the buttercups, which has bright yellow flowers an inch across; and *R. graminicus*, also with yellow blooms, which are borne on slender stems about eight inches high, rising well above the entire linear-lanceolate leaves.

Shrubs and Vines for Seaside Homes

FLORUM AMATOR

SOME years ago we were requested by a large inland nursery company to gather, from personal observation chiefly, such facts as we were able as regards what shrubs, trees, vines and herbaceous plants were best for seaside locations.

The result of those observations is that when any one asks us what shrubs will grow in seaside locations, our invariable answer is any which grow inland in approximately the same latitude and soil, and often others also. We, however, have to qualify this answer by stating that a limited number of shrubs which thrive inland will not grow quite as well at the seashore; that a moderate number are more at home near the seashore than inland, and that a large majority grows as satisfactorily at the seaside as in the interior, though as a rule somewhat more slowly.

To define the phrase, seaside location from a shrub planting point of view is somewhat difficult. We mean by these words that section of more or less fertile and well drained land, near the sea, but back a little from the sandy or rocky seashore itself and the sweep of the high tides.

There is indeed a *limited* number of shrubs, mostly natives, of which we will speak later, which live, making a slow growth, in the sand and among the rocks very near the water where the high tide sometimes sweeps up around them and the salt spray drenches them.

THE BARRICADES

The first act in seaside planting is to erect our barricades, that is, to plant along our boundary lines a thick hedge of such shrubs as thrive at the seaside and are suitable for that purpose. This hedge shelters from the direct violence of the winds, which are the most hostile of all factors in seaside planting, the other distinctly ornamental flowering and foliage shrubs which are planted within its boundaries and which are less able than the hedge shrubs to withstand the wind's force. These hedge shrubs must be such as are entirely at home at the seaside. Shrubs with small leaves, too, are preferable, because the wind sifts through these, but does not break or blow them over. Privets and Tamarisks make the best seaside hedges. Of these Privets and Tamarisks we will speak later. Usually a hedge on the boundary farthest from the sea is not a necessity, but a matter of choice.

DECIDUOUS SHRUBS

From the shrubs which are most at home at the seaside and those that grow approximately as well there as inland we naturally make our selections for seaside planting. Furthermore, if we occupy our seaside cottages only in the Summer, we choose out of the above classes those chiefly which bloom during the period from June first to October first.

It requires a considerable number of years for trees at the seaside to grow to a moderate size. On the other hand, shrubs planted at the seashore become established and constitute a pleasing environment of our seaside homes in a comparatively short time.

Lilacs, which we should speak of as *Syringas*, as that is their true name, are very much at home at the seaside, and are invigorated by the salt air, and the cool sea breezes. These bloom from mid-May till mid-June, lading the air with sweet perfume. Some bear double and others single flowers in many shades of pink, purple and white. One of the earliest shrubs planted in colonial

gardens of America was *Syringa vulgaris*, the common purple Lilac, which was introduced from England, and soon from these colonial gardens was disseminated through the towns and over the countryside, becoming the most familiar of all shrubs in the farmers' door yards. While we still plant this species, and its white variety, *alba*, in limited numbers, we select chiefly from the numerous beautiful single and double hybrid varieties of *vulgaris*, which are mostly the results of the labors of French botanists and horticulturists, but can be purchased of all American nurserymen who make a specialty of the ornamentals.

Spiræas are excellent for seaside locations. The earlier flowering species, which bloom freely in May, nearly all bear white flowers, and give but one crop of blooms in a season. The later blooming species, which are more desirable for the seaside, for the most part give their first crop of blooms in June and July; these, however, usually between June and mid-October give several other smaller crops of flowers, if after each crop, all withered blossoms are cut off and the ends of the branches cut back a few inches at the same time. To this Summer flowering group belong *Spiræa Anthony Waterer*, *S. bumalda*, *S. billardii*, *S. tomentosa*, a native species, *S. callosa* and *callosa alba*. Other desirable Summer flowering species, which, however, bloom but once in a season, are *Spiræa Van Houttei* and *S. Reevesiana*, blooming in June, and *S. Arguta* and *S. Douglassi*, blooming in July and August. Spiræas are very suitable for rather close planting in groups or beds, and *S. Anthony Waterer*, planted closely, makes an attractive low hedge.

The Tamarisk, botanically known as *Tamarix*, of all shrubs either foreign or native, is one of the most distinctly seaside-loving plants. There are four species, *Tamarix africana* and *T. gallica*, which bloom in the Spring, and *T. japonica plumosa* and *T. indica*, which flower in Autumn. Though Tamarisks appreciate a rich soil, they will thrive even in the sand so close to the shore that the salt spray at times drenches them. These shrubs have long been favorites in European countries for seaside locations. Their small, almost needle-like, dark green leaves allow the winds to sift through them and consequently not to break them down. As a hedge plant for surrounding grounds which are very near the seashore, and protecting them from winds and salt spray, Tamarisks are almost unequaled among deciduous shrubs. As this shrub endures pruning well, it can be stopped at any desired height and kept in a symmetrical form, and it should be so treated for pleasing results. The almost innumerable, very small light pink flowers of the Tamarisks are quite pretty and sprays of them are excellent for table decoration. Tamarisks through proper pruning can easily be made to grow singly as small trees.

As a foliage shrub, nearly evergreen, for seashore hedges or groups, the Privet, both the California, *Ligustrum ovalifolium*, and other species, *L. ibota* and *L. reghianum*, thrives remarkably well; indeed better than in inland locations; so well in fact that we are obliged to lay aside our prejudice against this shrub, because hedges of it are ubiquitous and therefore somewhat monotonous.

The Rose of Sharon, *Hibiscus syriacus*, both the single and double flowered varieties in their several colors, red, pink, purple, white and variegated, flourish near the sea. This is a symmetrical shrub, and flowers in September, when almost all shrubs have ceased blooming. This, too,

is a good hedge shrub, since it may be pruned closely for shape and yet retain its flowering habit. It cannot, however, be as closely planted to form a hedge as Privet, Tamarisk, *Spiraea* and evergreens, and hedges of Rose of Sharon are more open at the bottom than those of other shrubs. Individual specimens of the shrub are very

effective and are an artistic feature in any planting.

In the conclusion of this article, which will appear in our July issue, other cultivated and native deciduous shrubs will be considered, and besides these the dwarf evergreen trees, often looked upon as shrubs, and also vines, trailers and ramblers.

The Growing of Wild Flowers

BERTHA BERBERT-HAMMOND

THE indiscriminate digging of wild flowers for the purpose of transplanting them to the home grounds is a practice that should not be encouraged. Only those who can supply suitable environment and the conditions favorable for success should attempt removing rare wildlings from their habitat. In the hands of persons who understand the needs and care of nature plants, the making of a wild garden may prove a means of protecting and perpetuating some species until public sentiment aroused against the wilful destruction and waste of the wild flowers, decreases to a considerable extent the danger of their being exterminated by thoughtless or selfish persons.

Perhaps with the reforesting of devastated woodlands which our Government begins to realize is so essential to our national welfare, and which our own State (New York) is endeavoring to foster by a provision to exempt from taxation for thirty-five years, land reforested according to the law, there may follow an opportunity and a plan to restock these newly created woodlands with plants once borrowed from the forest that have been sheltered and given a chance to propagate in private wild gardens and rockeries.

Many of our wild flowers do well under cultivation and most of them improve in size and in other qualities. It is better not to molest those that are so thoroughly the children of the forest that they seem not only out of place with other surroundings, but to pine unhappily in captivity. In "The Exile Flower," Alice May Douglass voices the sentiment thus:

Stray child of woodland, thou modest exile,
'Midst my garden flowers how sad is thy smile,
So far from thy home 'midst the fern-scented bowers,
Does naught bring thee joy midst my rare-colored flowers?

Must thou fade? I but stole for thy winsome face,
And hoped that thy beauty my garden would grace.

Before transplanting wild flowers, the subject should be given careful consideration, and provision made for promptly setting out the wildlings in localities where the plants are likely to find the conditions requisite for their best development. While some kinds will grow under rather adverse conditions, there are others that require careful lifting and conditions almost similar to those of their native habitat.

The delicate, fragrant, three-lobed *Hepatica* (liverwort) which blooms as early and is quite as beautiful as the much admired Trailing Arbutus, may be transplanted with the assurance that the chances for success are favorable, for the dainty *Hepatica* adapts itself gracefully to garden culture, blooming freely and forming in a short time a vigorous growth. This plant, attractive both in leaf and flower, and for which there is a considerable demand, is kept in stock by some commercial growers, and not only the ordinary pink, blue and white varieties, but also double introductions are obtainable. With the increasing popularity of the wild garden and

rockery on large estates, the far-sighted, progressive grower might readily establish on a paying basis, the industry of propagating wild plants suitable for this special purpose.

Another plant that may be easily domesticated is the Indian Paint or Blood-root (*Sanguinaria canadensis*). It delights in rich, moist, well-drained soil, and will rapidly develop into a thrifty plant. Its large, white flower with golden center, though exceedingly beautiful, is rather perishable, lasting only a short time, but even when the plant is not in bloom, it forms an attractive garden clump with its large, prominently veined leaves.

Under cultivation the various sorts of trilliums improve in size of flower and spread out into fine large clumps. A distinguishing feature of the trilliums (implied by *tri* in the name) is the arrangement on a plan of three of the leaves and flower parts. The Painted Trillium (*T. undulatum*) one of the best known of this family with the Δ shaped purplish crimson markings seemingly painted on its white waxy petals, is an especially attractive flower.

Despite the fact that in its native haunt, the wild columbine (*Aquilegia canadensis*) seems to have a penchant for perilous positions among crannied ledges and craggy rocks, under cultivation it becomes quite tame and a most satisfactory, desirable and graceful member of the garden family.

When cultivated, the common blue violet waxes luxuriantly (spreading all too rapidly if space is limited) and develops a surprising length of stem and size of flower, that is hardly surpassed by the commercial varieties.

The wild iris (*I. versicolor*), the blue flag of childhood days, generally found in low, wet places, will accommodate itself most obligingly to a much drier location, and with its variegated violet-blue blossoms and sword-shaped leaves make an attractive and desirable plant.

The various species of *Cypripedium*, members of the aristocratic orchid family, possessing exceptional distinction of form and coloring, are considered by many the most beautiful of our wild flowers. The yellow Lady's Slipper (*C. parviflorum*) with its gold slipper-shaped lips is a dainty fragrant flower. The Moccasin-Flower (*C. acaule*) or pink Lady's Slipper bears a solitary flower of larger size and great beauty. These varieties thrive and improve under cultivation, but while once fairly abundant, they have become difficult to find.

Given a rather moist situation, the Cardinal Flower (*Lobelia cardinalis*) will thrive and produce spikes of flaming bloom from July to September. The intensely vivid coloring designed by Nature as an aid in fertilization and reproduction, has by an irony of fate proved the leading factor in the threatened extinction of the plant, for the brilliancy of coloring which has served to attract the friendly ruby-throated humming bird, also caught the covetous eye of the vandal, who has nearly exterminated the most gorgeously colored flower in Nature's own garden.

The Greenhouse, Month to Month

W. R. FOWKES

MIDSUMMER is at hand now with the middle of June, and all plants are in Summer quarters, and demand Summer care. Watering of most of them has to be heavier, and frequent syringing has to be exercised to keep red spider at bay. The surroundings of all glasshouses should be kept moist. Spray all shrubs nearby with Black Leaf 40.

Fire heat has been dispensed with and to avoid a stagnant atmosphere, maintain top air all night. Avoid damping down on rainy days. Cleanse the benches of all leaves or rubbish underneath them that has been accumulated during the Winter. Have the boilers emptied; flues cleaned out; all leaks repaired in order to be in readiness for Winter's work. Wash all empty flower pots and store away. Flats should be painted and stored until wanted.

Carnations that are planted must not be kept too dry. The frequent cause of insects, etc., on these plants during Summer is largely due to the plants not having sufficient water at the roots.

Roses that have been recently planted must be sprayed several times daily, and only kept dry on wet days. Do not use British methods to water overhead early and late. That practice in England is all right, but evaporation here is too rapid. The Britons have moist Summer heat that is conducive to plant growth, while we have practically to make a growing atmosphere owing to our arid climate.

Ill health in plants is due to overwatering or not enough; too much food, and using soap suds, or coffee-grounds, which some people use on their plants. These things should be avoided if one grows only a dozen plants.

The stove plants give us their best colors now, and require shading from the burning sun. Crotons, Dracenas, Heliconias, Anthuriums, Euphorbias are all in this class. The secret of their great color is by growing in small pots and feeding with suitable foods.

Poinsettias can be propagated. Take the young shoots and steep the bleeding portion in powdered charcoal and then place in sand.

Acalypha McKayi is a fine blooming plant from now on that succeeds nicely with gardenias. These latter beautiful exotics are now at their best. Give sufficient syringings to keep the mealy bug away, and keep them in a moist growing atmosphere at all times. See that these plants are dry at night.

To have flowers in Winter we must plant bulbs in Summer, and in view of this, soil should be prepared. The ordinary compost heap will do nicely, and incorporate one-third leaf mould and a little sand, and a six-inch pot of bone meal to a wheelbarrow load of compost. Failures occur sometimes through unripened bulbs which we cannot control, but failures also occur through using sour leaf mould or too much barn yard manure. There is a tendency among a few people to ridicule the idea of any dry manure, and to think that bags of fertilizer are just an added item of expense, whereas if they took the pains to inquire the amount of barn yard manure it takes to secure the same effect of a small quantity of chemicals, they would find the bag of fertilizer by far the cheaper.

I remember when studying at an agricultural college

across the water, the professors gave lectures about chemicals versus animal manures, and the following list will suffice to show what is really *not* contained in one ton of this bulky matter:

Value of fertilizing constituents in 1 ton of manure:

	Horse	Cow	Cattle	Sheep	Pigs	Poultry
Nitrogen	1.98	1.62	1.98	3.60	2.34	3.24
Phosphoric Acid..	0.27	0.30	0.34	0.44	0.63	0.87
Potash	0.66	0.42	0.48	0.84	0.48	0.48

So when all is considered, there remains but about twenty-four pounds of real plant food in one ton of this bulky manure which takes so long to apply.

Freesias are the first bulbs to arrive, and they favor a larger quantity of leaf mould than the other bulbs. Do not use it from maple leaves or any mixture. Oak and beech are the best and most reliable, and bone meal will supply all food.

Do not forget to place an order for iris. They have been forced in Europe many years, but became prominent here during the war when houses that were deprived of coal were planted with iris and gave excellent results.

Do not forget to press the soil in the rose houses after planting. This is necessary to give a firm growth. Put the wire stakes in place and the first wet day is a good time to give the plants their first tie, but do not be too severe for a few weeks, for they will make a better break and a larger bush while hanging around for a time, than if kept erect. Remember that roses require lots of air and plenty of water from now until September, and should be given no fire heat. Do not neglect to use Grape Dust, the great antidote for mildew.

Give the palms around the lawns or porches an ounce of sulphate of potash in two gallons of water three times during the Summer to put strength and firmness into the leaves that are growing so rapidly. See that the plants in the hanging baskets do not suffer from lack of water.

Immerse in a large tub of water, into which a peck bag of soot is soaking, nectarine and peach trees that have finished their fruitfulness. The laterals should be pinched back to five eyes and plunged outdoors up to the rims in ashes and should be well fed to perfect the fruiting wood for next year's work. They must not be thrown into some out-of-the-way place, if next year, first-class fruit is to be expected.

Nerines should be well ripened in the frames and sufficient water should be given until the leaves have ripened off entirely. They can then be placed on a dry shelf ready for Fall blooming.

Gloxinias and begonias can be kept healthy by not allowing the leaves to wilt. Often the plants will droop suddenly and examination reveals a very dry ball of roots under the large fleshy leaves.

The last batch of mums must be potted or planted in permanent quarters. Caps, singles and pompons, are very useful and are favorites with everyone. Their culture is simple and they can be grown in eight-inch pots and tied to stakes and pinched several times in order to make them bushy. This is more satisfactory than planting out in the garden and lifting in September, which results in the loss of foliage and a set back from the shock of lifting. They can be grown on the gravel walks or in any open position if no room is at hand inside.

Work for the Month in the Garden

SAMUEL GOLDING

THE planting season in the vegetable garden has reached its apex, and the most tender plants from greenhouses and frames will have been transferred into their final quarters. From now on throughout the Summer, the problem of perfect successions and adequate supplies, will demand the constant attention of growers. Where very young and tender vegetables are in constant demand, regular and frequent intervals of sowing are of the utmost importance.

The thinning of crops as soon as they are large enough to handle; persistent cultivation to keep the ground free of weeds and to have the surface soil loose and friable, are other essential duties to be performed. After heavy rains this should be done as soon as the condition of the soil permits, because with drying, sunny days, the ground cracks and evaporation is very rapid, making it urgent to hoe or cultivate to conserve the moisture. Artificial watering is thus made less imperative.

The attacks of insect and grub pests will require constant vigilance, and no doubt all preparations are complete for waging war with insecticide and fungicide. The cut worm is one of the most troublesome grubs at this season, and apparently takes great delight in its labors. Being somewhat of an epicure, it eats off the plants close to the ground when the seedlings are at their most tender stage. It is often the real cause of the apparent failure of seed to germinate, and will clear whole rows of seedlings as they are pushing through the soil. Poison bait is generally effective, but for small gardens which can easily be looked over, and one can see at a glance where the beans, egg plants or tomatoes have been eaten off during the night, the culprit can usually be found reposing near the scene of its depredations and can be personally dealt with.

Spray the potatoes with a solution of paris green, or arsenate of lead, to destroy the potato bug. During the early stages, if hot, dry weather prevails, the flea beetle is very persistent in its attacks. Spray with a nicotine solution. The same insect attacks tomatoes, and tobacco powder is a good preventive. Cucumbers, melons and squash must be watched at this stage against attacks of the striped beetle, and arsenate of lead or Slug Shot should be used.

During dry spells artificial waterings must be resorted to. When this is necessary do it thoroughly, and if possible, during the evening or late afternoon. Greatly improved and labor saving systems of irrigation have come to the fore during the last few years, some of which simulate the gentle rain, and are a great advance on the hose or watering can.

As soon as the early crops of peas are over, remove them at once, and use the ground for celery or late corn. Small crops of carrots, beets, lettuce, etc., can be grown between the celery rows. Growing celery should be given an abundance of water. Tie up lima bean growths to the poles to prevent them from being broken by winds or storms. Stake late peas, and give them a good mulch of stable manure which tends to conserve the moisture, and keep the ground cool, a condition necessary to the success of late peas. In dry spells they are subject to attacks of green fly which can be overcome by spraying with Aphine. A spraying during the evening is beneficial.

Tie up romaine and endive to induce fine blanched hearts; sow successions of corn, string beans, beets and carrots; plant late cabbage, and cauliflower, and encourage rapid growth to the onion crop by watering with liquid manure water. Occasional dusting with Scotch soot is a detriment to the onion fly, besides having fertilizing properties of a high order.

As soon as the early strawberry crop is over, remove the straw mulch, and layer the runners needed for any new beds which may be desired.

In the flower garden, especially where formal bedding is carried out to any extent, during the early days of June all is activity. It is the period of transition from Spring beds and flowers to the regular Summer beds. No time must be lost, when warm days and nights are with us and danger of frost is past, to push on with planting out, even the more tender garden subjects, so that they will derive the benefits from showery weather, and become well established before the torrid days of Summer are here.

It is best, if possible, to leave bulbous plants to ripen where they have grown or until their foliage turns yellow. Of course, this is not always possible, for when their bloom is over they are no longer attractive in the garden, and they often receive but scant consideration. We are eager to see their places filled with the Summer flowers. These old bulbs should be carefully lifted and heeled in a shady place to finish the process of ripening, before being finally dried and stored in a cool place. Give the beds a coating of manure and dig over before replanting.

Remove old plants of Canterbury Bells, foxgloves, as they pass out of bloom. Their place can be taken by late asters or some other suitable annual. Sweet Williams can be cut over and left, but it is a much better course to remove them also so that their place can be available for Fall flowers. They are easily raised from seed each year.

Plant the last batch of gladioli. If planted in groups of about twelve in each they make a fine display in the borders throughout the Fall.

There are now many wonderful varieties of cannas which can be used with fine effect in many parts of the garden, and their excellent foliage and gorgeous flowers are most striking from July until frost cuts them down.

Finish planting dahlias and it is a good plan to stake at the time of planting which prevents possible injury to the roots. Give early attention to all plants needing supports. This should be carefully done using stakes with due regard to the varying heights of the plants.

Give sweet peas abundance of water at this time with occasional soakings of liquid manure, and keep the flowers picked daily, and spray if attacked by green fly.

June is the month of roses, the queen of flowers. Keep the plants well supplied with water and during hot weather an overhead spray during the evenings will do much to improve the quality of the flowers. It also checks green fly and other enemies. From now on one must be continually on guard against the rose bug. Dust with Hellebore powder when any are seen, and many can be destroyed if shaken into a vessel containing kerosene.

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Soils and How to Improve Them

D. L. MACKINTOSH

OF all the things that the great Creator has given man dominion over, there is nothing so generous, so truthful, as old mother-earth. If you treat her well, she will repay you manifold, while on the other hand, if you neglect her and try to gain something for nothing, she will go back on you, and you have no redress.

Of course, you know that all soils are made out of rock to begin with. The knowledge, however, accurate and comprehensive, of the geological features of any particular locality will not enable me to predicate with certainty, the nature, composition and productiveness of its soil. So many circumstances of locality come into operation tending to alter the composition of the soil, and although we know, that, as a rule, a sandstone formation will give a sandy soil and a limestone formation a calcareous soil, we cannot be so sure of the exact nature of these soils. The position of the strata and the mixing of the detritus of these, the action of water upon soil and its shifting from one locality to another, as from a position on the hillside to one in the valley, will tend to introduce elements of different kinds, so that the soil from a sandstone formation, for instance, in one locality may be very different in its texture and productiveness from that of sandstone formation in another locality. Nor is distance of one locality from another an essential requirement in bringing about the diversity of soils. Very often it is found that the soil of one part of the farm gives no index to the nature of the soil in the other part. Indeed the difference may, and often does, appear in the small space of a few acres.

If you have about twenty acres of garden in one place, you may find in that twenty acres, five different kinds of soil. It would take more time and space than I have to spare to give the reason why. One lesson to be learned from the diversity of soil is that there must be diversity of manure and crops, and that is often one reason why Mr. Jones can grow certain things better than Mr. Thomas. Another thing, the season has something more to do with a man's success or failure, as the case may be. A test was made of the power of the soil to produce crops without manure as a means of judging the effect of atmospheric influence alone, and it was found that the lowest weight of the bushel and the greatest amount of straw corresponded with the season in which there was the lowest Summer heat, and the greatest number of rainy days, and the reverse as the case when the weather was the other way.

Soils are very much what you make them. Some years ago I took all the top soil off an acre of land. The first twelve inches I used for making a flower garden. To get the grade I wanted, I had to take three feet off in some places, and then I was left with Boulder Clay, where hardly anything would grow. If I had covered that acre with six inches of good soil, it would have taken 1,000 tons. I dug small holes seventeen feet apart and put one wheelbarrow of good soil in and planted two-year-old sour cherry trees; then plowed the land and sowed it down with rye. The next Spring I plowed the rye under and sowed buckwheat, which in turn was plowed under, then clover and next rape. I kept plowing two crops a year under for four years. After that the land was left fallow as all good orchards are. Several Summers ago I had the pleasure of seeing that place and those trees had grown so that they were growing into one another,

and the superintendent said to me that it was one of the best acres of land on the estate.

On the same estate there was another piece of land about one-fourth of an acre, where the soil had been nothing but rough gravel and sand, and according to the general plan, this part had to be planted with trees and shrubs. Spring came along, and there was no time to draw good soil on, so I dug small holes and planted small shrubs, giving each about two shovelfuls of good earth. As we had about six acres of new lawn, we let the grass grow until it was long enough to cut with a scythe; raked it off, and mulched the newly planted shrubs with it. Then for years all such organic waste was put on that piece of land. When I examined the land, the trees and shrubs had grown into a thicket and there were at least four inches of humus on top. I mention this place to you, for what can be done on one place, can usually be done on another. The moral of the whole thing is, you have the making of your own garden soil.

The principal soils are sandy, loam, clay and peat. Sandy soil is principally composed of silica, soda, lime and alumina. Clay is silica, organic matter, lime, carbonate and water. Peat soil is principally composed of organic matter; good loam has all that goes to make a good mixture. Let me suppose that your soil is light sandy and you are going to crop it with vegetables. Give it at the rate of not less than thirty tons of good rotten farm-yard manure to the acre. I know that most of our university people advise using the manure up when fresh. That is all well enough for clay soils, and if you are not in a hurry for the results. If you cover a lot of fresh straw in light sandy soil, you are going to form voids, with the result that your soil dries out more quickly. It may be all right to turn the hose on, but it is much better to conserve the water in the soil.

A man with less than one-quarter of an acre should never think of using a plow; dig it with a spade at least twelve inches deep. If you have a small plot you cannot do it justice with a plow and a team of horses, whereas if you dig it and dig it well, most of the work is done at one operation. But as plowing and digging are the fundamentals of agriculture and horticulture, too much stress cannot be laid on this operation, and men who want to have good gardens should learn the principles of digging. If you cannot get enough good manure, take what you can get and make it up with fine bone meal or bone super-phosphate, or, in other words, dissolved bones—these are bones treated with oil of vitriol. Liebig made this discovery and when he found out how valuable bones were as manure, he also found out that his country had been exporting a considerable amount of bone to Britain, 33,000 tons a year, as the Britons had been using bone in quantity as crushed bone for years.

We had about twenty acres of sandy soil, so sandy that if a heavy wind came before the crops were up, the seed was sometimes blown out of the ground. There was a cemetery along side this ground, where it was no uncommon sight to see radishes, lettuce, or cucumbers growing on top of the graves, the seed having blown up out of our gardens. Yet from this piece of land we could take out \$2,500 worth of early vegetables every year. If we had had water, there would have been no end to what we could have grown. All crops were off early; we then let the weeds grow up and before they went to seed we turned them under, then in the Fall we put on manure

and plowed that under. What we could not manure in the Fall we manured in the Winter, and plowed in early Spring. We used for top dressing ground bones, nitrate of soda, kainite acid phosphate and sulphate of ammonia. When lime was required we used clam shell dust, three tons to the acre.

If your soil is clay you can use much coarser manure and you need more lime, as the soil is cold and more retentive and water does not pass away quickly enough. Too much water is as bad as too little because it drowns the plants. It is not necessary to have plants covered with water to drown them.—if the soil is so wet for any length of time that it stops the air passages, the plants die from lack of air at the roots.

If your soil is peat, it is mostly composed of organic matter. You have very little lime, potash, phosphoric acid or magnesia, and therefore, if you are to be successful, you must add these things. I have seen a peat-bog in Massachusetts covered over with about twelve inches of sandy ground from a hillside and it yielded some of the best crops I have ever seen in my life. Of course there is peat and peat. The muck land that you grow celery in is very different peat from the peat you grow orchids in. A good test for acid soil is a piece of blue litmus paper. Put it in the soil for half an hour and if it comes out red, you need lime. You can get litmus paper from a drug store. Lime is not a manure in the true sense of the word, but you must have it as it liberates other minerals that are useful, and acts as a cleanser. The same may be said of common salt or iron sulphate.

My points are that no matter what your soil is to begin with, you can make it produce a good crop if you go about it the right way. Special manures can be bought from a good seedsman. But those of you who do not know anything about manures, stick to farm-yard manure, bone meal, blood manure and guano. There is a tremendous amount of good manure lost every year by not taking care of the sweepings of the street. I do not think it is a good thing at any time to let a garden grow up to weeds, but if you do have weeds, turn them under before they go to seed, and you are that far ahead. People who grow early potatoes every year on the same land usually have the crop off by the first week of August—they follow the diggers with a two-way plow, roll the land and sow rye or rape and pasture that off in the late Fall and plow under in the Spring, which gives them fresh soil by Spring. There is nothing better for land than to have it in grass once in a while, as it always helps it to recuperate. With the right kind of manure, good seeds, and a fair amount of hard work, the garden is almost assured of a crop.

WORK FOR THE MONTH IN THE GARDEN

(Continued from page 611)

Lose no time in sowing stocks of biennials. Propagate the early flowering phloxes, *Aubretia*, *Abris*, etc. Many of these are most attractive when used in bedding as a groundwork to tulips, for instance, the early yellow tulip with a groundwork of *Myosotis*; scarlet or red shades, with groundwork of *Arabis alpina*; and later, the Cottage tulip, Inglescombe yellow, or Primrose Beauty with *Phlox dicaricata canadensis*.

The cuttings of this phlox should be taken as soon as they are large enough, and should be wintered in a cold frame. Naturally they commence their growth earlier than those left out during Winter, and bloom from one or two weeks in advance, coming in right for associating with late tulips.

After the peonies have passed out of flower, give generous treatment throughout the Summer.

Remove all seed pods from rhododendrons, and keep a sharp lookout for red spider, and spray early. Many plants in the herbaceous border are subject to attacks of black Aphis at this time. Tobacco dust is a very good remedy.

CHINA THE GARDEN OF THE EAST

SELDOM has so appropriate a descriptive title been given a country as this which is applied to China. Not only are flowers cultivated universally by rich and poor, but they grow wild in never-ending profusion.

Among these wild plants are twelve species of rhododendron. In some sections of the country, notably in Szechuan, and extending north even as far as the region where famine is now ranging, are rhododendron forests growing at altitudes ranging from 2,000 to 12,000 feet. When these forests are in bloom the sight is said to be beautiful beyond description.

Azaleas are another striking family in the flower population of China. The plants are large and vigorous, the blossoms many-hued. Then there are the chrysanthemums, almost as numerous as in Japan. In numbers they are rivalled by the peonies. The poetic *Camellia* is widely cultivated, as are also orchids. Nowhere will one find more beautiful gardenias, or a greater variety of roses. And the lotus ponds enhance the beauty of many a private garden.

Then there are the trees. For centuries the blossom of the plum tree has been to the Chinese the symbol of all that is highest in man's nature and the best in life. The greatest painters have immortalized this blossom in their pictures, and so have the poets in their verses.

In the Spring may be seen in bloom orchards of apples, apricots, cherries, pears, peaches, and practically every other known fruit, though, not always are these fruits as luscious as those grown in this country. In North China they are apt to be somewhat tasteless, but in the South many a perfect variety is grown.

The varying climates in the huge expanse of China make possible the growing of tropical as well as hardy plants and trees. Among the former may be found pomegranates, oranges, lemons, bananas, dates and figs. Limited transportation facilities alone prevent the distribution of these fruits throughout the country. Each locality is mainly dependent on the fruits raised in that region.

Appreciation of flowers and of blossoming trees is even more general in China than appreciation of a perfect fruit. Indeed, it is hardly going too far to say that a Chinese would rather eat a bowl of rice under a flowery shrub than an elaborate repast embellished with fruits and served in a treeless or flowerless garden.

Of Interest to Country Estate Owners

The National Association of Gardeners takes this opportunity to place its Service Bureau at the disposal of owners of country estates when requiring competent gardeners, in the capacities of superintendents, head gardeners or assistant gardeners—thoroughly qualified in every particular to assume the responsibilities the positions call for—gardeners truly efficient in their profession.

The Bureau is maintained entirely at the expense of the association and makes no charge to the employer it may serve or to the member it may benefit.

NATIONAL ASSOCIATION OF GARDENERS

M. C. EBEL, Secretary

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Notes From Arnold Arboretum Bulletins

Cornus florida, which adds so much to the woodland beauty of eastern North America from southern New England to Texas, was covered here last Autumn with inflorescence-buds which appear during the Summer on short stems at the end of the branchlets between the upper pair of leaves, and consist of a cluster of minute flower-buds enclosed in four scales which are brown and more or less hairy during the Winter; in Spring the stalk of inflorescence lengthens from a quarter of an inch to an inch and a half, and the scales which have protected the flower-buds open and expand, turn pure white and form a flat corolla-like cup from three to four inches in diameter. The enlarged pure white scales which surround the flower-clusters are the conspicuous part of the inflorescence, for the flower themselves are minute and yellow-green. On many of the trees this Spring in the neighborhood of Boston the white scales are discolored by dirty red-brown streaks which make the trees seen from a short distance appear pink. The cause of this discoloration is not evident, although it may have been caused by the cold of Easter Monday following several days of unseasonably hot weather. At that time, however, the inflorescence-buds of *Cornus florida* had scarcely begun to swell. Whatever the cause of the injury its occurrence this year, when there is an unusual bloom, is doubly unfortunate, for the Flowering Dogwood often loses its flower-buds entirely in New England as we are close to the northern limit of the range of distribution of this tree, which further south flowers more profusely and develops larger bud-scales. Forms of this tree with the scales which surround the flower-clusters varying in color from light to dark red (var. *rubra*) occasionally occur in southern woods, and some of these forms have been propagated by nurserymen and are popular garden plants, especially in the neighborhood of Philadelphia, where there are many specimens of the "Red-flowered Dogwood." Several plants of this variety are now blooming by the shores of Jamaica Pond in Boston where they are flowering more abundantly than usual, for the flower-buds of this variety appear to be less hardy than those of the typical form. This is unfortunate, for when the red and white-flowered trees are planted together in masses they produce when in flower a brilliant effect. There is a form of *Cornus florida* with pendulous branches, and another on which the flowers are called double from the presence of an inner row of white inflorescence-scales. These abnormal forms, however, have little to recommend them to the lovers of handsome trees. *Cornus florida* is as handsome in the Autumn as it is in the Spring, for the upper surface of the leaves turns bright red, the lower surface retaining its pale Summer tint, and the abundant clusters of scarlet lustrous fruits are conspicuous and beautiful. Not less beautiful in Autumn are two trees with bright yellow fruit which have recently been found, one near Oyster Bay, Long Island, and the other in North Carolina.

Azaleas.—The large orange red flowers of *Rhododendron* (*Azalea*) *japonicum* are fast opening, and although the plants on the lower side of Azalea Path are not as full of flowers this Spring as usual there are flowers enough to show their beauty. *Rhododendron japonicum* is a common shrub on grass-covered foothills of the mountains of central Japan where it is a vigorous shrub from three to six feet high with stout erect stems and clustered flowers from an inch and a half to two inches in diameter which open as the leaves unfold. More beautiful is the hybrid *Azalea Louisa Hunnecell* (*Rhododendron kosterianum* var. *Louisa Hunnecell*) which was raised at Wellesley by crossing *R. japonicum* with *R. molle* (the *R. sinense* of many authors), and is the handsomest of the hybrid *Azaleas*. A number of plants of this hybrid are now in flower on the lower side of Oak Path near its junction with Azalea Path, and opposite a group of plants of *Rhododendron japonicum*. On the lower side of Oak Path, near the junction with Azalea Path, plants of a hybrid between *Rhododendron obtusum amoenum* (the well known *Azalea amoena* of gardens) and *R. obtusum kempferi* (*Azalea kempferi*) are now in bloom. This hybrid was raised at the Arboretum several years ago by Jackson Dawson and has been named *Rhododendron arnoldianum*. The plants are dwarf in habit and the flowers on the different plants vary in color between that of the flowers of the two parents. A few of the plants in this group are worth propagating for the edges of beds and for the rock garden.

Two American Azaleas.—Plants of *Rhododendron nudiflorum* and *R. roscum* are in bloom on the lower side of Azalea Path, and the groups of these plants which are now side by side afford opportunity for the study of these two New England *Azaleas*. The flowers of *R. nudiflorum*, which are pale pink and open a few days earlier than those of *R. roscum*, have not the fragrance

which adds so much to the value of the rose-colored flowers of *R. roscum*. The fact that this plant can grow in soil strongly impregnated with lime will make its cultivation possible, it is hoped, in parts of the country where, on account of lime in the soil, no other *Rhododendron* can be kept alive.

Rhododendrons with evergreen leaves are widely scattered over temperate regions of the northern hemisphere and extend into the tropics in southern and southeastern Asia. Several hundred species are now recognized, the largest number on the eastern Himalayas and on the mountains of southwestern and western China where botanical explorers have recently found innumerable new and often handsome species. One or two species grow in northern China, two in central Japan, one in the Pacific states, and five in the Atlantic states of North America; two species grow on the mountains of central Europe and four in the Caucasus. The number of species which can be successfully grown in the Arboretum is only nine; four from eastern North America, one from Japan, one from China, one from the Caucasus and two from Europe. Of these several are rare in American gardens, in which hybrids are generally cultivated. Eastern North America is not a *Rhododendron* country. A few of them grow better on Long Island than they do in New England; they might grow more successfully in Pennsylvania and Delaware where they have not been very largely planted, or in some favored valley of the Piedmont region of Virginia or North Carolina; further south the Summer sun is too hot for many of the species. On the north-west coast of this continent in western Oregon, Washington and southern British Columbia the soil, moisture and temperate climate are favorable to broad-leaved evergreens, and it is in that region that it seems possible to establish a collection of *Rhododendrons* which might equal and perhaps surpass the great collections of southwestern England, in the best of which several hundred species now flower every year. In the United States *Rhododendrons* have been more largely planted and better cared for in the neighborhood of Boston than in other parts of the country; and judging by the best collection in America, at least, of the so-called Catawbiense hybrids on which incessant care, intelligence and money have been expended continuously for seventy years the results which can be obtained from the cultivation of these plants in New England are not great in comparison with the results obtained in regions better suited to their requirements.

Rhododendrons usually grow on mountain slopes where, although the atmosphere is saturated with moisture, their roots are in well drained soil, and where they are often protected in Winter by snow. Here in New England they grow best when planted on the north side of evergreen trees, protected from the stimulating effect of the hot sun of March which excites growth and increases the danger from late frosts. Planted in such a position at the base of Hemlock Hill in the Arboretum there are good plants of Catawbiense hybrids. *Rhododendrons* are not particular about soil provided it is well drained and is free of lime. A few of the new Chinese species grow naturally in limestone soil, but none of them are hardy in the eastern states. For the *Rhododendrons* which can be grown here lime is fatal, and persons who go on year after year trying to overcome this peculiarity of nearly all plants of the Heath Family are throwing away their labor and money. *Rhododendrons* suffer from insufficient moisture at the roots and cannot be safely planted within reach of the roots of vigorous trees which deprive them of it.

The species of *Rhododendrons* which have proved hardy here are the eastern American *R. maximum*, *R. catawbiense*, *R. minus* and *R. carolinianum*, the European *R. ferrugineum* and *R. hirsutum*, the Caucasian *R. smirnovii*, the Chinese *R. micranthum* and the Japanese *R. brachycarpum*. The four American species are perfectly hardy and can be grown without difficulty. *R. maximum* is the largest of these, becoming sometimes a small tree in the sheltered valleys of the southern Appalachian mountains. It has beautiful, dark green, lustrous leaves pale on the lower surface, and clusters of pink and white flowers which do not open here until July and are a good deal hidden by the branches of the year which have nearly finished their growth before the flowers appear. *R. catawbiense* is a round-topped shrub with beautiful foliage and lilac purple flowers of a distinctly disagreeable color. It grows on the southern Appalachian Mountains, sometimes covering near the summits of the highest peaks, at altitudes of between five or six thousand feet, thousands of acres with impenetrable thickets; it occurs, too, sparingly in the Piedmont region of North Carolina and on the mountains of northern Alabama. *R. carolinianum* and *R. minus* are southern Appalachian species; the former is a dwarf compact shrub with leaves covered below more or less thickly with rusty brown scales, and compact clusters of small

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A Lesson on the Plant In Relation To the Soil

Being One of a Series of Lessons of a Home Study Course on Gardening, Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

While most people recognize the definition of soil, the word is sometimes used outside its true meaning and is applied to any portion of the surface of the earth which is not hard rock. In its real sense a soil is only that portion of the earth's crust in which plants may grow, and it is always composed of mineral, animal and vegetable matter. The foundation of a soil is pulverized and disintegrated rock, which is purely dead inorganic matter, incapable of supporting any of the higher forms of plant life, however finely it may have been disintegrated.

To become a soil this decomposed rock must have organic matter incorporated with it, and, speaking generally, the greater the amount of organic matter the greater is the fertility of the soil, presuming that all other things are equal. Low forms of plant life, like lichens and mosses, are the earliest to start into growth as they require practically no organic matter, and they themselves are not only capable of dissolving rock but their decay commences the production of organic matter and therefore they mark the first step in soil formation.

The characters of the original rock necessarily affect the physical and chemical properties of the resulting soil, as the various rocks are composed of minerals having a different combination of elements and a different percentage composition. These chemical and physical properties together determine the value of a soil for crop production.

From the point of view of the plant—that is of the higher forms of plant life—a suitable soil for it is one which combines those physical and chemical properties which are best suited to its growth.

There are many factors involved in the physical properties of soils, but they are all based upon the size, form, and arrangement of the soil particles. Soils vary in weight with the composition and the size of the particles, and the size of these particles varies from those scarcely distinguishable with the microscope, as with clay, to coarser rock fragments, such variations determine the type of the soil, whether it is clay, sand, or loam. In most soils there is a predominance of one grade, as clay in clay soils, and medium sand in sandy soils; no soil is, however, composed entirely of one grade. Clay particles are exceedingly small, it would take five thousand of the larger ones, if laid in a line with edges touching, to measure an inch; while it would only take fifty of the medium sand particles to measure an inch. Clay soils owe their properties to the fineness of the division of their particles rather than to their chemical composition. Any mineral when finely pulverized has physical properties similar to clay; but while this is true from a physical standpoint, the term clay is chemically only applicable to aluminum silicate which is formed only from the disintegration and decomposition of feldspathic rock. It is this latter fact which causes clay soils to be invariably richer than those known as sandy. The drawback to a clay soil is its heaviness in working and the difficulties which exist in handling it. Much of the trouble connected with growing plants in a clay soil is due to improper cultivation, mainly that of working it when too wet and sticky. From all points of view the most satisfactory soil is that which is termed a loam in which the properties of both sandy and clay soils are combined in such a way as to eliminate the disadvantages of either.

To a considerable extent the natural characteristics of a soil may be gathered from the plants native to it. To give a few examples: the Pin Oak is always found in a rich, wet soil, while the Post Oak (*Quercus stellata*) never grows naturally but in soils which are dry. The prevalence of the Elm invariably indicates a good soil with the water-table not very close to the surface. Extensive woods of *Pinus virginiana* show the existence of a poor, dry soil, as in the Pine barrens of western New Jersey. Black Ash thrives upon swampy, undrained soils, but White Ash flourishes best in fertile, moist, but at the same time, naturally well-drained ground. The presence of much Sorrel (*Rumex acetosa*) whether in cultivated or uncultivated soil is a sure indication of acidity, indicating that an application of lime is required; while the opposite condition—although of course not absolute alkalinity—is shown by plenty of Clover growing. Horsetails (*Equisetum, sp.*) as readily indicate that subsoil drainage is required. A plentiful and strong growth of Chickweed (*Stellaria media*) is a pretty good sign of a fertile soil, rich in humus.

Most of our food crops have their special likes and dislikes as regards soil. We know that in many parts of the country extensive districts are devoted to the commercial production of some particular plant because the soil conditions are the most favorable to it, while the district may be as distinctly unfavorable for another. For example, it would be only courting failure to attempt the growing of first class cauliflowers upon a soil eminently suited to sweet potatoes, as the latter require a dry sandy soil while the former do best in one of an almost opposite character. Although the physical properties of a soil are mainly responsible for a given crop doing specially well in a certain locality, there are sometimes climatic conditions which also have a bearing upon the matter.

While the commercial grower generally finds it necessary to fit the crop to his soil, the home gardener has no choice in the matter, as he has to grow something of everything his climate is capable of bringing to maturity, irrespective of his soil, he therefore has to fit the soil to the crop.

In a garden which has been well handled for a number of years much of the soil's natural character will have become changed, any extreme features it may have possessed ameliorated, and it should have become fitted to grow any kind of garden crop satisfactorily. In the case of a neglected garden or of a new one, the first step is to plan the reducing of, and ultimately eliminating, any bad features it may possess. This is never the work of a day, nor of a year, for in most cases it will take several years of continual suitable treatment to bring a soil into such a condition that it will suit all the plants desired to be grown in it; this refers especially to the vegetable portion of a garden.

On the ornamental side there are some plants that require special soil relations which are easily supplied at once so far as the initial planting in a suitable soil environment is concerned. Among these the Rhododendrons and most other members of the *Ericacea* family are very particular in requiring an acid soil, or at least one that does not contain any appreciable amount of lime.* If it is determined to grow these plants and have them permanently successful in a district having a soil naturally unsuited to them, then at least two feet of the existing soil should be removed and replaced by that of a suitable character containing plenty of humus and which shows an acid reaction when tested with litmus paper. Again if we have a very poor and extremely sandy soil and wish to grow roses two feet of the sand should be removed and replaced with a clayey loam. It is always possible to make the soil environment more pleasing to any plant of a permanent nature we wish to grow by adding sufficient of some suitable earth at planting time to afford room for at least a year or two's growth of roots, beyond which the soil may be ameliorated to suit further root extension by cultivation and manuring, as well as by soil addition if necessary.

While, in dealing with soils which have at some time or another been under ordinary cultivation for any appreciable period, we shall find them suitable for the general run of shrubs, etc., used for ornamental planting, provided the preparation and setting out has been properly done, in dealing with any extreme or peculiar soil condition, there is much to be said in favor of fitting the plant to the soil, as it is simpler and less expensive, especially as plants can be found which will fit any of the natural positions capable of growing a plant at all, or in other words, there is a plant for every place. In these days when people are rightly giving more attention to American plants it is easy to have those naturally at home in any peculiar or extreme soil conditions our home surroundings may afford, from a sandy bank to a swamp. Too frequently plants are placed in soil for which they are totally unfitted. Mistakes in this direction are very often made by those responsible for the planting plans, as many landscapists appear to be very ignorant of horticulture. There is considerable to be learned from a knowledge of a plant's native habitat, not only as regards soil conditions most suitable but also, in many instances the best treatment to be given after planting. Take for example Rhododendrons, which we refer to again because it is extremely rare to see a group of these doing really well in home surroundings, and many who should grow them refrain from

* A few species of Rhododendrons have been discovered in China by Forest and Wilson which apparently revel in a limestone soil.

doing so because of the fact that their neighbors do not succeed with them. Including azaleas, there are some ten species of *Rhododendrons* native to this country which are perfectly hardy, in the Northern States, and I have yet to find a district in the country in which they cannot be made to flourish. Correct soil treatment after planting is important with everything, but with no class of plants is the importance greater and more vital than with *Rhododendrons*, and their failure to thrive is invariably due to either neglect, or, which is worse, to wrong treatment.

The correct soil treatment after planting is learned by going to Nature and seeing plants growing in their native homes. In the case of some species we may find specimens thirty and forty feet tall growing on the mountain side with a very small depth of soil under them. From the day, we know not how many hundreds of years ago, the seedling plant from which these originated, started, there has been an annual fall of leaves upon them, the decay of which has resulted in the gradual accumulation of the bed of leaf mould in which these specimens are growing. The proper treatment of these plants cannot be more plainly indicated, but some people are either ignorant of Nature's methods or they think that it is she who is ignorant of the right thing to do and they compel their *Rhododendrons* to exist with nothing but bare soil under their branches, a condition of things which is maintained by continuous raking in what in this case, as well as in others, amounts to a craze for ultra tidiness. While provided we have a soil which is free from lime and is neither pure sand nor pure clay leaf mould is not absolutely essential to plant *Rhododendrons* in it is essential that they have the soil in which they are growing annually covered with leaves and that these leaves are allowed to remain all the year. Ten or twelve inches is not too thick a covering of leaves to apply every year some time between October and Christmas. Combined with this annual leaf application there will be a continual leaf decay with the production of leaf-mould into which plant roots will penetrate.

Soils have to be considered not only from the standpoint of their physical condition and their chemical contents, but also from that of their biological characters. Unless the biological character of a soil—in other words its bacterial content—is suitable for the plant we wish to grow, which suitability is based upon the symbiotic influence which one form of plant life has upon another, the plant cannot thrive. The term symbiosis is used today in a somewhat more extended manner than heretofore. Strictly speaking we think it should only be applied to the intimate association of two distinct organisms with benefit to both or at least to the plant we desire to grow; but the use of the word in connection with pure parasitism having a harmful effect upon the higher form of plant life, appears scarcely warranted. It can scarcely be doubted that all plants require more or less, the existence of their own special bacteria in the soil, and that the species and number of these micro-organisms contained by the soil is just as important a consideration as its physical and chemical characters; at the same time, however, it appears that these organisms are more necessary to some plants than to others. Bare ground is undoubtedly inimical to soil bacteria. In forestry the vital importance of preserving the forest-floor is fully recognized, which floor has been formed by the decay of the leaves and needles of the forest trees, and the difficulties in reforestation when this floor has been destroyed are very great; difficulties which are mainly due to the absence of bacteria which have either been scorched out by the sun shining upon the bare ground, or washed away with soil denudation. The practice of raking away all leaves from under shrubs and trees is the reverse of beneficial; with the ordinary deciduous shrubs and trees that root more or less deeply, the leaves should at least be spaded in, but with many subjects like *Rhododendrons* which are surface rooting, spading cannot be done without harm, and in any case these, as previously stated, should always have more leaves added yearly and left alone to decay. Needles of conifers should never be raked away, as their decay is absolutely necessary to the life of those microscopic plants whose symbiotic action has such beneficial effect upon growth of coniferous plants.

In dealing with a piece of ground devoted entirely to crops, like vegetables, the soil can be treated as a whole. Of the two extremes a very sandy soil on the one hand and a heavy clay on the other, it is difficult to say which is the worse. One of a sandy nature can be worked at any time; it is an insatiable devourer of manure, and is the poorest in natural plant food; but it is capable of giving earlier Spring crops as it soon warms up after Winter. A clay is always colder: seeds cannot be sown so early in the Spring; it is more difficult to work, and a few days must always be allowed to elapse after rain before handling it; but when handled properly it withstands drought and is capable of carrying heavy crops.

While soils containing a more or less large proportion of clay—a pure clay does not exist—require more labor expended upon them than do those of a sandy nature, they require less manuring than the latter and plant-food is not so readily washed

out of them. Every gardener who has had much experience in handling soils of differing physical characters is aware of the great advantages in having one which is easily worked in spite of perhaps some chemical disadvantages connected with it.

The most obdurate clay soil and one running very closely to pure sand, can be so handled as to ameliorate their respective disadvantages, and various means to this end will be discussed in the next lesson.

NOTES FROM ARNOLD ARBORETUM BULLETINS

(Continued from page 614)

pure pink flowers which open in early Spring. It grows apparently equally well in full exposure to the sun and in the shade of pines and other trees. There is a white-flowered form with thinner, less rusty brown leaves, which is still rare in gardens and appears rather less hardy than the pink-flowered type. *R. minus* grows from low altitudes, as at the locks on the Savannah River above Augusta, Georgia, up to altitudes of thirty-five hundred feet on the Blue Ridge of North Carolina. It is a shrub sometimes ten or twelve feet tall, with leaves covered below with glandular scales and pink flowers, which in northern gardens do not open until the end of June, and after the shoots of the year have nearly attained their full growth. A fine variety of this species (var. *Harbisonii*) from northern Georgia with larger flowers is not yet in cultivation. The two European species *R. hirsutum* and *R. ferrugineum* are dwarf shrubs with small pink or carmine flowers, the former with branches covered with hairs and leaves glandular hispid on the lower surface, the latter with glabrous branchlets and leaves covered below with rusty brown scales. Of the two *R. hirsutum* has taken more kindly to cultivation, at least in the Arboretum. It can grow in soil impregnated with lime. *R. smirnowii*, a native of the Caucasus, is said to become a tree sometimes twenty-five feet high; in the Arboretum, where it is hardy, it is a shrub four or five feet high, with oblong, acute leaves dark green above and covered below with a thick, yellowish or tawny felt which also covers the branchlets, and protects the leaves from the attacks of the lace wing fly. The flowers are bright pink and beautiful. Of the hundreds of species of *Rhododendron* which grow in China only the northern *R. nictanthum* has up to this time showed itself able to support the New England climate. It is a straggling shrub with small leaves and small compact clusters of small white flowers which give to the plant the appearance of a *Ledum*. The Japanese *R. brachycarpum* is a handsome shrub with leaves which resemble those of *R. cataebense*, and rather compact clusters of large pale pink or pale straw-colored flowers.

"NOTHING NEW UNDER THE SUN."

Shortly after the literature was circulated by the National Association of Gardeners to create public sentiment against the sign board nuisance which threatens to mar the scenic beauties along our highways, a communication was received from one of the national association of sign board interests offering evidence that its industry is one of the oldest in the world's history, just as gardening is proclaimed to be one of the oldest in the world. In the year 1666, Charles II, in the seventh year of his reign, initiated an act, "That in all streets no sign boards shall hang across same." This regulation was closely followed in France in 1669. The ancient Egyptians perhaps excusably had but slight use for signs. The first distinct evidence we find, however, is with the Romans. Not only have the actual original signs been recovered, but in many places we find Horace, Phædrus and Cicero referring to signs. Phædrus mentions the "painted signs" as "signs we see painted on the walls of taverns;" while Horace, the beloved poet was so moved by a wall-sign which portrayed a fight that he wrote, "I admire the men painted in red or black, moving as if they were actually living and fighting as if actually real." Cicero, the great Roman orator, says while deriding some opponent presumably, "I shall show you how you look. (To which he answered, 'Please do.')

Then I pointed my finger towards a cock painted on a sign board." These and many other quotations seem to show that the outdoor advertising business was at least a lusty infant when Cæsar was fighting his Gallic wars.

While the foregoing is illuminating, it does not permit any license for the wanton desecration of our highways by sign board vandals or any reason why the campaign inaugurated to combat this nuisance should be suppressed.

Other communications from individuals and organizations in all parts of the country received by the committee of the National Association of Gardeners, revealed the surprising interest in this movement, and indicated that the time for action is now, but that it thus far has lacked co-operation to bring about unified action.

The Sign Board Committee of the National Association of Gardeners, 286 Fifth Avenue, New York City, will be glad to hear from other interested sources which are ready for co-operation in curbing this constantly increasing nuisance.

Departments of Foreign Exchange and Book Reviews

FOR THE PERENNIAL BORDER

It is generally conceded that for the vast majority of herbaceous perennials and the greatest variety of soils there is no season of the year more suitable for planting than that of early Spring. It is as true of the seedling as it is of the more established example, and equally so of that older type of the last named, for which division of the rootstock in conjunction with transplanting are essential if the plant is to give of its best. It is true, too, from the propagator's point of view, inasmuch as it is at that season of the year that the majority of herbaceous perennials, starting root and branch anew, also develop, if opportunity is afforded for so doing, a proportionate number of the latent eyes or buds which may be found about the bases of the stems, it may be of Torch Lily, Tufted Pansy, *Delphinium*, Michaelmas Daisy, *Pyrethrum*, or many another besides. Left to themselves in undivided clumps, these same buds are either crowded out of existence altogether or go to swell that little forest of weakly growths more common, happily, in clumps of herbaceous border plants a decade or two ago than they are to-day. Thus it would appear that cultivators generally are moving in a right direction, and that amateurs, realizing how to make the most of things, are also prepared to cultivate their border flowers on more rational lines than hitherto. In former times it was no uncommon thing to see great mat-like swards of the Michaelmas Daisy occupying a border, the nearly bare stems and inadequate floral display but the net result of starvation—the exacting toll of neglect. To-day we know that these same plants merit annual or biennial division and transplanting, giving some thirty, some fifty, some a hundred foll of their flowers, as the result of the cultivation bestowed. In principle, the same is true of other plants—*Phlox*, Sunflower, *Helianthus*, *Campanula*, Day Lily and the like—and the measure of their success at flowering time will be also that of the cultivation—or lack of it—they receive; hence the desire for timely action.

At all times a well-prepared border is essential to success. Such preparation is more easy of accomplishment in the case of a new border where trenching and manuring can be done in advance, and without such hindrance or interruption as is inseparable from a border not destined for complete overhauling. So much, however, might be advanced in favor of the latter, and so good the results, that in all cases where possible it is worth pursuing. All the same, there are many things—*Phlox*, *Pyrethrum*, *Potentilla*, Japanese Anemone, *Delphinium*, Day Lily and Pæony, to name but a few—that are infinitely better if left for two, three, or even a greater number of years, and to these the importance of a well-prepared border at the outset cannot well be overestimated. In the case of heavy soils, the addition of grit and leaf-soil will assist drainage, just as a free addition of lime will assist porosity and do other important work. For light soils the manure should be introduced low down, where later it may play the part of a cool retreat—a sponge—for the roots in the event of dry weather.

In short, the big clump of Pæony, Michaelmas Daisy, Lenten or Christmas Rose, *Iris*, *Pyrethrum*, or what you will, is to the planter a delusion and a snare; a youthful specimen is capable of much better work. The obvious reason of this is that the youthful plant has unlimited opportunities for development, while the big clump, with its score or so of crowns, can only develop a tithe of them and root fibres *pro rata*; hence the fallacy. *The Garden*.

THE TRUE SHAMROCK

The plant at the present time accepted as Shamrock by Irishmen almost everywhere, at home and abroad, in Ireland and in England, is the Lesser Yellow Trefoil (*Trifolium minus*). It is this plant which—with an occasional and accidental exception in favor of the Yellow Trefoil of cultivation (*Medicago lupulina*)—fills the stalls in Covent Garden, and is carried by the post in time for St. Patrick's Day to every part of the world where Irishmen congregate, which is to say everywhere. In the Trinity College Botanical Garden in Dublin it is grown especially to satisfy the demands of English enquirers for the real Shamrock. It is this which is fastened on the Christmas and St. Patrick's Day cards made up in Dublin and Belfast, and of which the seed is, by their means, distributed.

As every botanist knows, *T. minus* is widely and commonly distributed through Great Britain and Ireland, but he will find it difficult to convince an Irishman of the fact. In his belief, the plant is found only in the island which St. Patrick made his own; when removed from it the plant cannot live—"if its roots be not

fed from its own Irish clay it will wither," said a recent writer, and this is the popular view. Another popular belief is that the Shamrock does not flower. I remember once in Ireland asking a man whether the *T. minus* I showed him was Shamrock, and he at once disqualified it on the ground of its yellow flowers. Mr. Colgan had a somewhat similar experience in the Aran Islands, where some men whom he asked to find the plant were "apparently inclined to fix on *T. minus*, but seemed so staggered at the appearance of its flowers that they gave up the search in the belief that it was too late for the Shamrock." This belief is quite intelligible when it is remembered that in March, when the Shamrock is most in request, *T. minus* has not put forth its blossoms.

But was *T. minus* the original Shamrock? So far as the legend which connects the plant with St. Patrick is concerned, it may well have been; but the name itself, in its earlier appearances in literature, was associated with the Purple and White Clovers (*T. pratense* and *T. repens*); it is these which Gerard (1597) says "are called in Irish Shamrocks," and it would seem that the name was applied more especially to the former. No poetical or fanciful reputation attached to the plant at the period named, or for some time later: it will doubtless surprise many to know that, to quote Mr. Colgan: "For almost a century from the date of its first appearance in literature the Shamrock presents itself solely as a breadstuff or food herb of the Irish, probably only so used in times of famine or scarcity of corn." Referring to this Lobel, who, in his "Stirpium Adversaria Nova" (1570), having spoken of the value of the clovers for fattening beasts, goes on to add that "the mere Irish grind the meal for their cakes and loaves, which they knead with butter, when they are vexed and nigh madened with a three days' hunger" (I quote Mr. Colgan's translation of Lobel's Latin). Henry Mundy, an Oxford doctor, writing in 1680, says that "the Irish that nourish themselves with their Shamrock, which is the purple Clover, are swift of foot and of nimble strength." The latest reference to the use of the Shamrock as food is that of Sir Henry Piers in his "Description of Westmeath" (1682), who, however, does not suggest it was regarded otherwise than as ordinary food: "Butter, new cheese and curds and shamrocks are the food of the meaner sort for all this season."

The earliest reference to the wearing of the Shamrock occurs in the Journal of Thomas Dinely, kept in the year 1681 but not published until 1856; here the wearing and eating are combined—"The vulgar superstitiously wear Shamroques, 3-leaved grass, which they likewise eat (they say) to cause a sweet breath." But so far as published literature is concerned, the first record of the wearing in connection with St. Patrick's Day, or to the legend which associates the Shamrock with the Saint's preaching, is less than 200 years old—a fact which seems almost incredible, seeing how generally the legend is known. Threlkeld made botanical excursions in all the surrounding country, as well as in Meath and in the north of Ireland. His book, one of the earliest on the Irish flora, includes more than 500 species, with the localities in which they occurred, their English and Irish names, and their medicinal properties. Robert Brown named in his honor the Chenopodiaceous genus *Threlkeldia*.

His reference to the Shamrock runs as follows: "*Trifolium pratense album*, white-flowered Meadow Trefoil. The Meadow Trefoils are called in Irish Shamrocks. . . . This plant is worn by the People in their Hats upon the 17. Day of March yearly (which is called St. Patrick's Day), it being a Current Tradition that by this Three Leaved Grass he emblematically set forth to them the Mystery of the Holy Trinity. However that be, when they wet their *Seamur-oge*, they often commit Excess in Liquor, which is not the right Keeping of a Day to the Lord."

It will be noted that Threlkeld refers to the legend as "a current tradition," and I see no reason why it should not have been handed down from the fifth century, when St. Patrick preached. The custom of "wetting" or "drowning" the Shamrock is happily nowadays "more honored in the breach than in the observance." —*The Garden*.

PLANT PERENNIAL POPPIES

Though the Poppies are individually very ephemeral flowers, they afford us such wonderfully intense glowing color masses in the garden and hardy border that it is difficult to imagine what we should do without them. The delicate texture of the petals, charming and distinctive foliage, well poised flowers and attrac-

tive budhood, all combine to make an ideal flower, a flower that we admire and love the more perhaps because it is so fleeting. Speaking of their budhood reminds us too of how fascinating it is to watch the buds gradually push out from between the leaf axils, carrying a drooping case, green and hairy, that daily becomes fuller and fuller, until at length it stands erect and we know that, early on the morrow, the enclosing case will break asunder, detach itself from the stem at the base and the thin, closely packed satiny petals slowly unfurl in the sunlight.

A Poppy flower is never more beautiful than when three-parts expanded and while the edge still retains its marvellous crinkling and crimping. Nor is the beauty entirely past even after the petals have faded, for the clustering stamens, with their masses of blue-black pollen still hang and the seed capsule looks most attractive. Where the flowers are not cut, this capsule continues to be an object of interest all through its development and ripening, until the final stage is attained, when the roof rises and the tiny windows open and the winds of Autumn sway the stems and scatter the tiny seeds in all directions.

Among my own favorites are the tiny Alpine Poppies, which resemble the fine Icelanders both in growth and colors, though they are but 6 inches in height and reduced throughout in proportion. In little informal drifts against granite rocks they are ideal, the yellow, white, orange and rose flowers appearing to special advantage by contrast with the gray blueness of the rock.

Occasionally among the seedlings one comes across a variety with beautifully fringed petals and these are worth special attention for seed-saving purposes. The Iceland varieties form one of the daintiest of table decorations and, as a broad belt edging to a large border, will remain flowerful from June to October, during which time they throw up thousands of their glorious blossoms. I must confess that I love the pure gold, orange yellows and pure whites far and away before the newer hybrid forms, the colors of many of which are too muddy and indeterminate to be pleasing.

The Oriental type is the most forceful and, at times, aggressive flower in all the June garden and truly wonderful are the glorious flesh pinks, crimsons, salmons, scarlets and apricots, all of which have a striking black and purple blotch at the base of each petal. These Oriental varieties need careful placing, for while so gloriously brilliant for a short time, the foliage soon becomes very shabby and dragged after flowering and one must group them behind some quick-growing, later flowering perennial, that can be tied out and staked so as to fill the gaping hole they leave in the border, and screen them when they are in the unsightly stage.

A little known form very seldom met in gardens is *Papaver rufifragum*, which flowers from June till September. It is a slender grower, rising to 2½ feet, with unusual orange buff hued flowers that, associated with light grasses, make a most attractive decoration.—*The Garden*.

FERNS FOR ROOMS

Many of these, most beautiful in themselves, are of but little value for house decoration. To have them suitable for this purpose the fronds must be green, yet so hardy as not to be affected by the cold draughts from open windows. How often do we see during the Winter the frosty air blowing in on plants as they stand on tables near the windows, and if such are at all tender their foliage is soon cut down. Among Ferns there are but few more useful for this work than the *Pteris* family. Their fronds are hardy, and at the same time many of the species are most pleasing.

P. tremula.—It is alike useful in a young and small state as well as when grown to a goodly size. This species, particularly if not too much pot-bound to need frequent watering, stands well in a room, as plants in such places are apt to get dry, particularly during the Summer. In small pots this plant is most useful, for when well grown it can be employed for a variety of purposes, and being of such free habit it makes, in a 5-inch or 6-inch pot, a nice specimen well furnished with its noble fronds. Seedlings are so easily raised that a good stock may be worked up in a short time. It is not at all particular as to soil, but a light, rich, sandy loam seems to suit it best.

P. serrulata is of hardy constitution, easy cultivation, and its graceful habit at once places it in the front of our decorative Ferns. Either in small pots or when grown to a larger size it is alike useful, as its light, graceful fronds lend themselves to almost any place, and being of such a lasting nature do not soon suffer when exposed to cold winds or allowed to get dry. The freedom with which this variety is produced from spores, and the rapidity of its growth, enable it to be used more often than could otherwise be done were it more tender. It enjoys a liberal amount of water, and should not be exposed to the scorching rays of the sun during Summer, otherwise the fronds are not of that freshness so desirable. There are several varieties of this, all more or less beautiful.

P. cretica is deservedly one of the most popular greenhouse species for decoration, particularly the variety known as *P. c. albolineata*, the bright line down the center making it very attractive, more especially when the fertile fronds are removed.

Lomaria gibba in a young state is very attractive, and thousands are used every year for table and other decorations. Grown in small pots it is most useful, and may be employed for a variety of purposes; the light, palm-like fronds, which grow so close to the pot, enabling the plants to be used in places where it is difficult to have palms. When grown in a 6-inch pot the plants are very useful for vases, but they must on no account be allowed to get dry at the roots, or they soon suffer.

Lygodium japonicum is usually grown in gardens under the name of *Lygodium scandens*. For decoration it is most useful, as its slender climbing stems may be employed in a variety of ways. When grown in small pots the growths can be trained round pier glasses, etc. They are also useful for table decoration and for hanging baskets. The fronds are very leathery, and stand a long time in water, which is a great advantage. At one time no Ferns were so much in request for decoration as *Adiantums*. Either cut or in pots there was always a demand for them, but since the greenhouse forms of *Asparagus* have become so popular there is not the same call for *Adiantums*. Still, as pot plants, particularly in a small state, they are much in request, and thousands are sold daily in our markets. Being of such easy culture, and accommodating themselves to all sorts of places, they are sure to remain in favor as long as there is a rage for small plants. When well grown they make nice subjects for rooms, but they must on no account be allowed to get dry at the roots or be stood in the draught, or the fronds will soon shrivel up. Fine specimens may be grown in the course of a few months, particularly if well fed with manure-water. As to soil, they are not at all particular so long as it is of a light, sandy nature. *A. cuneatum* should not be grown in too much heat, neither ought the plant to have a dense shade, or the foliage will be of very little use for cutting. *A. gracillimum* ought to be grown fully exposed to the sun to make the fronds hardy if they are to be of any value.—*Gardening Illustrated*.

DEPARTMENT OF BOOK REVIEWS

DISEASES OF ECONOMIC PLANTS, by F. L. Stevens, Ph. D.; the Macmillan Co., New York.

Wonderfully well formed, and a model of the book-maker's art, this compact volume is a delightful one to handle; and the contents are in keeping. Himself the senior co-author of the original edition of eleven years ago, the author puts into this just published revision all the new knowledge concerning this most important subject that has been acquired in recent years. No subject assuredly is more vital than that of safeguarding the feeding of the world through plants consumed directly or through meat produced from them. At present the subject is of peculiar importance because of the calamitous multiplying of pests afflicting almost every kind of economic, and ornamental plant. There is consequent advantage then in having this work of a most careful and judicious student, who, wisely beginning with all that can be gained from the history of plant diseases and of the prevention or cure of them, with so fine discrimination in fields naturally confused by bewildering theories and multifold remedies recommended upon the basis of imperfect or unauthoritative experimentation, sets forth concisely the best method of procedure up to date. Tree surgery and spraying are handled quite discreetly.

Every agriculturist, horticulturnist and floriculturist would do well to master the chapter on General Diseases before studying in the book the topic of particular interest to him. He will find a most gratifyingly clear, concise and accurate treatment of diseases affecting the special crop, with sufficient illustrations, and references to a bibliography for more detailed investigation and the handling of the problem in varying local phases. In the bibliography are placed, in 556 different groups, the titles of the reliable treatises, most of which are fortunately in the form of free public bulletins. The index should be used to supplement the table of contents; but both the botanical and the common name, like *paeonia* and peony, must be looked up. In the matter of Ornamental Plants alone are there deficiencies; but they are to a great extent necessary deficiencies, for "aside from a few standard flowers, as, for example, Roses, Violets, Chrysanthemums, Carnations, etc., and certain nursery stock, so few individuals are interested, or the financial risk in these crops is so small, that large expenditures of public funds have not been made for investigation or control of the diseases."

Dedication of Entrance Missouri Botanical Garden

THE dedication of the new main entrance of the Missouri Botanical Garden to replace the old edifice built by Mr. Shaw in 1858, was held under the colonnade of the new gateway, May 10, 1921. Mr. Edwards Whitaker, president of the Board of Trustees of the Missouri Botanical Garden, presided, and after an invocation by the Rev. Dr. John S. Bunting made the following remarks:

"During Mr. Shaw's life and for some years after, this gate provided sufficient accommodations to those visiting the Garden. Later with the opening of the Garden on Sundays and other attractive features to the public the

might speak from that intimate personal fellowship which perhaps some of those who are here today enjoyed. But the spirit of a man is made manifest not alone while he is here with us but by the things he does and says which live after he has passed on.

"So thousands who could not know Henry Shaw in the flesh nevertheless have a deep sense of gratitude to him and of kinship with him. Hundreds of thousands of those who neither knew him nor have known of him nevertheless will be indebted to him. For the influence of the work that has been done here and, indeed, the influence of these gardens themselves, has spread throughout the nation. The lives of thousands unconsciously have been modified and enlarged and made happier through this influence; and these in turn, knowingly or unknowingly pass on to others the inspiration received through the opportunity that Henry Shaw made possible to them.

"He had a keen sense of duty to his fellow man. He came here from a foreign land. In a comparatively short space of time he amassed a fortune. Unlike many who have had a similar life experience, he did not depart with his gain, but devoted his remaining years to good works. He had a high sense of citizenship which ought to be felt by every right-thinking citizen.

"If I should undertake to place relative values upon the various activities

which are being carried on here and measure them in percentages, I should place first the subtle influence which these gardens exert upon the lives and characters of those who come for research and, more especially, for the pure joy of living among the beautiful plants the good God has given His people.

"Wise parents bring their children in contact with Nature in her varied forms. They take them where they may see Nature in her rugged aspects, that they may see evidences of the mighty forces which were at work when the land was shaped. They take them to the rivers and to the sea that they may see God's hand upon the waters, now in repose, again lashed into fury by the winds. They take them to the fields and to the forests that they may have some understanding of our dependence upon the soil. They bring them to places such as this, where plants of almost endless variety of form and color, fragrance and beauty, appeal to the finer emotions and thus develop a love of the gentle and beautiful which influences thought and action throughout life and which adds largely to the capacity for happy living.

"Men who have studied such matters tell us that sufficient records have been found to prove the existence of some six or eight great civilizations prior to the one in which we are now living. They tell us further that each of these great civilizations was preceded and followed by periods of darkness; that they went through certain fairly well-revealed stages, the last being the period of wealth. They tell us that as the period of wealth develops there comes the fevered pursuit of artificial pleasures, the rush to the cities, the desertion of the open country, and the consequent breaking down of character and lapse once more into a period of darkness and despair.

"If this, which we like to think of as the most advanced
(Continued on page 621)



View of Main Entrance from Interior of Garden.

attendance increased, and for some time the Board of Trustees have realized that larger and better accommodations at the main entrance were needed. How to provide them was a question. It resulted in what we all at times have had to meet, a financial problem. You are aware that the Garden is supported from the income of the Shaw estate only, about one-fourth of the income being consumed in paying licenses, taxes, etc., to the city and state. In time a plan was evolved whereby with the approval of the circuit court a loan was secured providing funds, with a provision that a percentage of the annual income be devoted toward liquidating the indebtedness.

"We meet today to dedicate this structure, and I hope and believe that with the enlarged facilities for the convenience of visitors their numbers may increase, as they can secure a better and more pleasing impression of the Garden than was heretofore possible.

"The Garden has an enviable reputation, both internationally and nationally, standing in the front rank everywhere as an institution of scientific and horticultural attainments.

"We have been fortunate in securing as speaker of the day the Hon. Henry C. Wallace, Secretary of Agriculture, and I take pleasure in introducing him." Honorable Henry C. Wallace made the following address.

"It is a privilege to be here today and an honor to be asked to speak briefly on such an occasion. You are in a way dedicating anew to the use of the public these wonderful gardens which for more than half a century have been an inspiration to those who visited them and which have contributed much to our store of knowledge of God's great vegetable kingdom.

"Instinctively our thoughts turn first to that generous-spirited citizen who made all of this possible. I wish I

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

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Vice-President—George H. Pring, St. Louis, Mo.
Secretary—M. C. Ebel, 286 Fifth Ave., New York.
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New York—Mrs. J. J. Albright, George F. Baker, Edwin S. Bayer, Albert Clayburg, W. R. Coe, Mrs. F. A. Constable, Paul D. Cravath, Mrs. W. Bayard Cutting, Mrs. Charles Daniels, Cleveland H. Dodge, Mrs. David Dows, Frank J. Dupignac, Mrs. Coleman du Pont, Childs Frick, W. H. Gratiwick, Daniel Guggenheim, Mrs. W. D. Guthrie, Mrs. William P. Hamilton, Mrs. John Henry Hammond, T. A. Havemeyer, Mrs. L. A. Hermann, B. H. Howell, C. O. Iselin, Otto H. Kahn, Mrs. Frank B. Keech, W. Eugene Kimball, L. C. Ledyard, Jr., Adolph Lewisohn, John Magee, Mrs. Julius McVicker, Morton H. Meinhard, Mrs. Eugene Meyer, Jr., J. Pierpont Morgan, Mrs. J. Pierpont Morgan, Stanley G. Mortimer, Mrs. Harold I. Pratt, John T. Pratt, E. F. Price, Mrs. William A. Read, H. D. Roosen, Charles A. Sherman, Mrs. Samuel Sloan, Benjamin Stern, Mrs. W. Stursberg, Daniel Tatum, Mrs. R. M. Thompson, Mrs. Edwin Thorne, Mrs. Henry M. Tilford, Carl Tucker, Samuel Untermeyer, Mrs. Harold T. White, Mrs. Payne Whitney. *New Jersey*—A. Albright, Jr., Charles A. Bradley, Joseph P. Day, James B. Duke, Mrs. Lewis L. Dunham, Mrs. Frederick Frelinghuysen, Mrs. K. S. Goodrich, Mrs. Gustav E. Kissel, C. Lewis, Mrs. Paul Moore, Hubert T. Farson, Mrs. Manuel Rionda, P. S. Straus, Mrs. John I. Richard, Mrs. Ridley Watts. *Pennsylvania*—Samuel T. Bodine, Gen. Richard Coulter, Mrs. J. D. Lyons, R. B. Mellon, Gifford Pinchot, George F. Tyler, Edward A. Woods. *Delaware*—Irene du Pont, Pierre S. du Pont, Harry G. Haskell. *Connecticut*—E. C. Converse, Dr. and Mrs. Tracy Farnam, George M. Hendee, Miss A. B. Jennings, W. H. Truesdale, William Ziegler, Jr. *Rhode Island*—Miss M. R. Case, Gov. R. Livingston Beekman, George P. Wetmore. *Massachusetts*—Mrs. William C. Conant, Harry E. Converse, Mrs. Henry C. Frick, Mrs. Louis Frothingham, Henry S. Hunnewell, C. H. Hutchins, A. K. Lawrie, Mrs. C. G. Rice, Prof. C. S. Sargent, Mrs. J. A. Spoor. *Ohio*—F. F. Drury, H. S. Firestone, Mrs. Frances F. Prentiss, John L. Severance, H. S. Sherman, H. L. Thompson. *New Hampshire*—F. G. Webster. *Indiana*—Theodore F. Thieme. *Illinois*—A. Watson Armour, Harry B. Chow, A. B. Dick, Clayton Mark, Mrs. Julius Rosenwald, Mrs. F. W. Upham. *Wisconsin*—Mrs. Chester A. Congdon, F. H. Stoltze. *Iowa*—Mrs. G. B. Douglas. *Missouri*—August A. Busch, Dr. George T. Moors. *Virginia*—Miss Grace E. Arents. *W. Virginia*—Mrs. Arthur Lee. *Kentucky*—F. M. Sackett. *Georgia*—C. H. Candler, E. H. Inman. *S. Carolina*—Robert S. Mehane.

NEW MEMBERS

The following new members have recently been added to our association: Niels P. Hansen, Riverside, Conn.; Gustave Christenson, Greenwich, Conn.; Robert H. Furness, Cornwall-on-Hudson, N. Y.; Frederick Whitehouse, Stamford, Conn.; Andrew Iro, Greenwich, Conn.; Albert Bergstrom, New York City; William Matheson, Mt. Kisco, N. Y.

AMONG THE GARDENERS

Ernest E. Stubbs has accepted the position of gardener on the R. Waverly Smith estate, Glen Cove, L. I.

John Marx, until recently foreman of the greenhouses on the W. R. Coe estate, Oyster Bay, L. I., accepted a similar position on the Pierre S. du Pont estate, Wilmington, Del.

Niels P. Hansen secured the position of gardener to Robert Swaine, Riverside, Conn.

Arvid Anderson resigned his position as superintendent of Overlook, the estate of Mr. Deers, Moline, Ill., to become a member of the firm of Rose-View Greenhouses, Beardstown, Ill.

GARDENERS' 1921 CONVENTION

The committee has its plans well under way for the coming convention to be held in New York City. The executive committee considers the first part of October as the most agreeable time of the season for the members to arrange to be away from the estates at the least inconvenience to their employers and themselves. Exact date will be announced later.

The Park Avenue Hotel, Park Avenue at 32nd street, will be the convention's headquarters. Arrangements for the convention are being decided upon, and the final program will be announced in the July issue of the CHRONICLE. The tentative program follows:

Tuesday morning, executive meeting of the Board of Trustees and Directors, while the attendants to the convention inspect the Bronx Botanical Gardens, where they will be guests at luncheon of the New York Horticultural Society. The visitors will be escorted direct from the Gardens to the opening meeting of the convention at the Park Avenue Hotel. The entertainment of the first evening will be left to the choice of the visitors, as New York provides so many varied forms of amusement.

Wednesday forenoon and afternoon will be occupied with business sessions, the sessions adjourning at noon for a luncheon to be provided at the hotel. The annual banquet will occur Wednesday evening.

Thursday forenoon, immediately after election of officers, and final business is disposed of, the convention will adjourn. A visit to Long Island by automobiles for an inspection of some of the beautiful country estates and to be the luncheon guests of horticultural interests at one of Long Island's country clubs, provides Thursday's entertainment.

Friday, the visitors will inspect New York City's park system and become the luncheon guests of the owner of one of America's show places located in Westchester County, and enjoy an automobile tour through Westchester, visiting some of the interesting country estates.

Surprises for the visitors during their stay in New York are being withheld for a later announcement.

The Park Avenue Hotel announces the following rates: Single room, without bath, \$2.50; with bath, \$4; double room, without bath, \$4 and \$4.50; with bath, \$6 and \$7. It asks that reservations be made at as early a date as possible, for October is a busy month in New York, and the Hotel is usually well occupied.

SUBJECTS FOR DISCUSSION AT THE 1921 CONVENTION

The operating problem, which concerns owners as well as the superintendents of estates, should receive the first consideration of the convention. Civic and general welfare work will also have its part on the program to indicate that the gardener and his association are not selfish, but liberal in their consideration of the welfare of others.

Our committee on the training of young men, held a meeting at the International Flower Show, with Vice-President Pring, of the Missouri Botanical Garden; H. E. Downer, of Vassar College, and Montague Free, of Brooklyn Botanic Garden, present. This committee expects to present tangible plans to the convention to act upon.

The sign board committee is already doing good work, having succeeded in interesting individuals, many of whom are prominent, and national organizations and horticultural societies to co-operate with us. They will present a report of their work accomplished during the last year, and suggestions for the future carrying on of this campaign.

Quarantine Bill No. 37 has not been neglected, and an interesting report of the committee is anticipated for the annual meeting, showing the progress which has been made.

We wish that our members would consider the subjects carefully that they may be well able to discuss them, and to present their views at the coming convention, and that those who find it impossible to attend, will send in their opinions by letter to the secretary.

ARGUMENTS ON EXAMINATIONS FOR GARDENERS

The secretary will be glad to publish the views of any members on the subject of examinations for gardeners, which is arousing so much discussion as to whether the association would be able to work out feasible plans to institute such examinations.

Members of the association have expressed their opinion on this subject in the letters which follow, which have been received at the office of the secretary during the past few months.

PITTSFIELD, Mass., January 7, 1921.

Editor, GARDENERS' CHRONICLE:

Ever since Arthur Smith fired the first shot regarding examinations for gardeners, which was resonant in Newport, and which finally seemed to take to the ground during the recent convention of the N. A. G. in St. Louis, I have awaited further developments "with silent watchfulness." The first shot evidently lost much of its impetus ere it reached the ground of

discussion where to all intents and purposes it was accorded a solemn requiem. For was not the context of Mr. Smith's remarks laid aside as impracticable, and a suggestion far more ridiculous put forward advocating a gardeners' census?

Still undaunted, Mr. Smith resumes his attack in the (December) issue of the *GARDENERS' CHRONICLE* and promises further recommendations in a later number.

I agree that the type of examination, thus far suggested, could be made perfectly feasible without imposing a burden on the N. A. G. since the entry fees of participants would be made an equitable asset. I do fail to understand, however, just how a gardener can prove his practical ability by a written examination. A gardener's clerical capacity proves little or nothing and as for the importance of attaching to what a few gardeners imagine would be a "coveted" diploma. I'm from Missouri! To my own personal knowledge the R. H. S. examinations have been conducted over a much longer period than Mr. Smith claims for them, and yet even today the R. H. S. diploma fails almost utterly of recognition.

Any person, whether gardener, banker, or politician can give no better evidence of his ability than to succeed where he is. It is my humble opinion that a gardener can progress in no better way than to first and always make up his mind to turn the circumstance of his present environment to the very best account. He cannot accomplish this by an imaginary rapid-transit route, such as the haunting of a diploma would seem to suggest. The employer's approval must be the one great aim; and let us remember that an employer's opinion is based on results and that he looks at results in the abstract. If a gardener's character and ability, for instance, has been put to a practical test in a position where there is scope for full demonstration of the highest faculty and he has failed to manifest any such capability, of what use would any quantity of N. A. G. or college diplomas be to him?

JOHN JOHNSON.

"Thornewood," SOUTH TACOMA, Wash., January 6, 1921.

Editor, *GARDENERS' CHRONICLE*:

May I be allowed to express my opinion on the subject of examinations for gardeners, one which I might safely say has troubled the minds of many gardeners who have wished for some means to stamp a bonafide gardener. Alas, it is a difficult problem.

I believe there is no other occupation that offers itself to so many interlopers, sometimes through the employers desiring to use cheap labor and, on the other hand, sometimes through the gardeners having Mr. So-and-So speak for them. In the latter case the applicant is very often never asked by his prospective employer where he learned the art of gardening—no. "Mr. So-and-So told me of you; you worked for him on such and such a place." I can tell of a place not far from here where such a man has charge of the laying out of a new estate, and that estate is not a small one for there are kitchen and flower gardens, a Japanese and an attempt at a little Italian garden, a long drive into the estate, lawns, terraces, herbaceous flower borders, etc.

I was asked to give advice on some construction work but when I found out how matters stood on this estate I left as quickly as possible. I learned that, after the man in charge was working on the job which had been started by a landscape architect, the owner dispensed with the landscape man as soon as he had the lay of the place. My informant told me that the man in charge had been a railroad man, however—he that as it is—I had not been with him many minutes before I had him summed up.

I have cited this case before; it is not an isolated one. A man can have certificates, but of what avail are they if the employer is bent on inexperienced labor?

Now back to the subject of examinations. One must not forget that gardening is a profession and an art. I began as an apprentice in 1885 and have gone through each branch in good establishments under good and approved head gardeners—have now been fifteen years head gardener on large, well kept estates. In addition to my training on private places during my journeymanhood days I had short periods in nurseries, and also some two years with a noted landscape architect. Many are the times that I have had talks with fellow gardeners along this very line, and the more one knows from practical experience, the more difficult one sees it is to make questions—no matter how well they might be pro and con—armor proof. No matter how well they are answered, if the person is not by nature a gardener and has gone through practical hard training, no certificate in the whole world will make him a member of the noble profession.

However, a young man might start on the right road, do well, get his papers and forward them to the N. A. G. office, have them recorded and sent back to him, and so on through his training career and even when he attains a position as head gardener. I merely give this as by chance it may give some one an idea to work out a plan.

I had a wish, more than that, I even wrote to Kew Gardens, London. I was accepted to go there, but before doing so I asked the advice of the head gardener under whom I was working. His answer was that unless I was thinking of going in for a curator's position, not to go. Without going into detail, I am not sorry that his advice was accepted, and that I kept in good service, studied hard, read good books, and acquired some nursery experience.

THOMAS WILKINSON.

"Rohallion," RUMSON, N. J., June 1, 1921.

Editor, *GARDENERS' CHRONICLE*:

I have read with interest Arthur Smith's article in your recent issue *re* Examinations for Professional Gardeners. I have always believed in a thorough study of the sciences which underlie the principles and practices of horticulture, but as one who holds a diploma from a botanical garden, also a first class certificate from the R. H. S. of England, which Mr. Smith mentions in his article, I am at a loss to see how the N. A. G. can be benefited in any way by instituting these examinations.

Is it Mr. Smith's idea, that this is to be a test for membership in the N. A. G.? If so, then in my opinion, it is too late a date to start this. Does he expect those who are already members to take this examination, and if they should not pass first class, does he wish them expelled? Or does Mr. Smith expect a law to be passed such as that which prevails in the medical profession, that unless one has a diploma he cannot practice?

I do not believe that the R. H. S. of England ever instituted the examinations with any such ulterior motive as Mr. Smith has, that of trying to distinguish between those qualified to be classed as professional gardeners and those calling themselves gardeners but who have little claim to be considered as such, but I believe their aim was to try and induce the young men to take up the study of the science and practice of horticulture. I knew many young men who failed to pass this examination, yet they were good practical young fellows and made good gardeners.

Nor is this examination of the R. H. S. a test for membership. Any one who is able to pay the desired number of guineas, is entitled to a fellowship. I thoroughly believe in examinations and diplomas for those who are graduating from horticultural schools and colleges as then it is an incentive for the student, but this is no duty for such an association as ours. I honestly believe if such a thing is put in force in the N. A. G. then the death knell of our society has been sounded.

I believe that the success of the society can only be assured through adopting an even wider policy than we have done heretofore.

This talk of those who profess to be gardeners, and those who are really professional gardeners should stop, and even if there are a few who possibly do not know as much as some of us profess to know, then it should be our duty as fellow men and fellow gardeners to give of our knowledge freely, so that others may be benefited.

Who are we that we should dare to put a man through an examination to know whether he is entitled to the name of professional gardener? If there are some who are earning their living doing gardening work, who have not had the chances for study, and experiences that some of the rest of us have had, who are we that we dare take that man's job and means of livelihood away from him, because he has not sat at an examination to see whether he is entitled to the name of professional gardener?

W. H. WAITE.

DEDICATION OF NEW ENTRANCE TO MISSOURI BOTANICAL GARDEN

(Continued from page 619)

of all civilizations, is to escape the fate of those that have long since been sifted over by the sands of oblivion, we must profit by the experience of those who have gone before. We must keep our people close to Nature and to Nature's God; for in no other way can we implant in the young those great principles which make for clear thinking and right living, without which an enduring civilization is not possible. In such a task beauty spots like this are invaluable aids.

"Rich is the city which has at its door such a place for inspiration and study freely open to young and old, rich and poor, great and small; freely open to all who will come. And rich is a city and a nation which produces citizens who are willing to give of their time and their money to perpetuate institutions such as this."

At the conclusion of this address, luncheon was served to about three hundred specially invited guests.—*Missouri Botanical Garden, Bulletin.*

LOCAL SOCIETIES

AMERICAN ROSE SOCIETY.

On the afternoon of June 1, the Executive Committee of The American Rose Society, with some especially invited guests, visited the rose garden of Dr. Walter Van Fleet, at Bell, Md., to inspect the many new and beautiful Rose hybrids, which are to be disseminated through the Offices of The American Rose Society and its Nurserymen members.

The chief interest centered in the Rose W. C. 124, which is to be officially christened "Mary Wallace" at the Portland Rose Festival in June and which is to be disseminated in the Fall of 1922 and Spring of 1923. Of great interest also were W. H. T. 37, W. S. 18 and a large number of others which were covered with blossoms despite the unfavorable season, and which it is hoped may be disseminated in the future under similar arrangements.

A meeting of the Executive Committee of The American Rose Society was held at 1214 F street, Washington, D. C., on the evening of June 1.

Plans for the propagation and dissemination of the rose "Mary Wallace" (Van Fleet W. C. 124) were perfected and announcements have been sent to all nurserymen who are believed to be interested in participating in the propagation of this rose under the conditions drawn up by the U. S. Department of Agriculture and The American Rose Society. Chief among such conditions are propagation in time to allow dissemination in Fall of 1922 and Spring of 1923, and the selling of the resulting plants at \$2.00 each, paying to The American Rose Society a royalty on each plant sold during the first selling year. Any Rose growing member who issues a retail catalogue and who has not received the official announcement and blank contract may secure these by writing the secretary's office at once. A deposit of \$50 is required with each contract as an evidence of good faith. Application should be sent at once and will not be accepted after July 1.

There was a long discussion on the policy of the Secretary in regard to the registration of Roses having names either identical or similar Roses previously introduced, and it was voted that the Executive Committee should have authority to refuse registration in such cases.

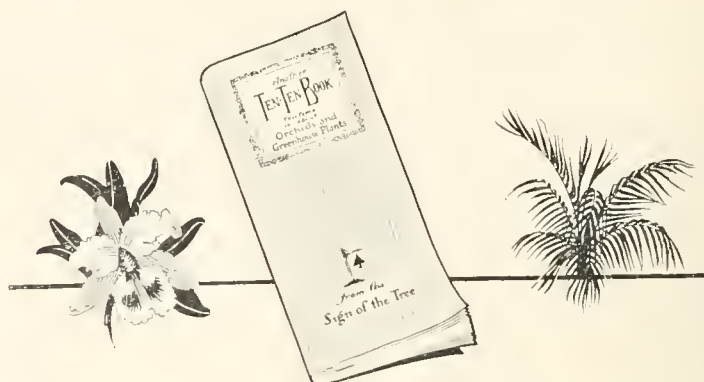
The Editor reported that the handbook was ready for publication, but has been delayed by the printers' strike.

Over 100 members of The American Rose Society assembled at Gude's Flower Store at 9 a. m., June 2, for the all day Rose Pilgrimage. The party went by Automobiles to the Arlington Test Garden, where many beautiful roses were seen in bloom. Here Dr. Ball, Assistant Secretary of Agriculture, made an address, telling of the many sided work of the Department of Agriculture, speaking in detail about the Rose Test Garden and Dr. Van Fleet's work at Bell, Md.

The party then proceeded to Twin Oaks to see Mrs. Bell's charming rose garden, and thence, via Rock Creek Park to the Walter Reed Hospital, where, through the courtesy of Col. Glennin, a luncheon was served.

After the luncheon the Annual Meeting was held.

President Pyle at the beginning of the meeting expressed the thanks of the society to Col. Glennin and Prof. Lumsden



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And now it's made, you'll find it a real friend when it comes to buying Orchids, palms and greenhouse plants in general.

If you are a regular shark on species and varieties, it's arranged so you can pick out exactly what you want in a jiffy.

If you are one of the many, who have just a nodding acquaintance, as it were, you can turn to

the Ten-Ten Groups and know that you will find there the ten best of its kind.

You can select from the ten, or order the complete group; which latter would in every case, give you a choice and varied collection.

Furthermore, its arrangement and text are such that your employer will find it highly interesting. You know full well, that when they become interested, it's a lot easier to get the plants you ought to have. Drop us a card with your and your employer's name and address, and we will take genuine pleasure in sending you both this new member of the Ten Ten family.

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for their kindness in inviting the members of the society to visit the Walter Reed Hospital.

The first business to be brought up was the election of officers, and Mr. Gude at once moved the re-election of all officers and directors whose terms expired. This was seconded and immediately carried.

The officers thus re-elected for one (1) year were: President, Robert Pyle; Vice-President, F. L. Atkins; Treasurer, C. H. Totty; Secretary, John C. Wister.

The directors thus re-elected for three (3) years were: John H. Dunlop, Wallace R. Pierson, Robert Simpson.

President Pyle then spoke for a few moments about the proposed Washington Rose Show Garden and the Portland Rose trip which is scheduled for June, 1922. He then called upon Prof. Corbett, who spoke about Dr. Van Fleet's work at Bell, and upon Secretary Wister, who spoke of the work of the Secretary's office, and about the dissemination of the "Mary Wallace" rose. Dr. Shoemaker then told of the work of the Takoma Horticultural Society, and Miss Harrison expressed the wish that The American Rose Society should come to Washington again next year. Mr. McFarland spoke very briefly about The

American Rose Annual, and then Mr. Gude closed the meeting with a tribute to the work of the Walter Reed Hospital.

It was by this time after 3 o'clock and the rest of the afternoon was spent in inspection of the buildings and grounds of the Hospital under the guidance of Col. Glennin and Prof. Lumsden.

The thanks of The American Rose Society are due to Mr. Gude and his local committee who planned the itinerary of the day's trip and who made the day such a successful one.

JOHN C. WISTER,
Secretary.

ST. LOUIS ASSOCIATION OF GARDENERS

The first outdoor meeting of the Saint Louis Association of Gardeners was held Sunday morning, June 5, at the Missouri Botanical Garden. The matter of representation at the New York convention was taken up and discussed, and it was decided that an official delegate to represent the association be selected at the next meeting and members were urged to make an effort to attend the convention. It is hoped that a presentable delegation will be able to attend.

After the meeting the morning was spent in looking over the large plant collections in the Garden and conservatories. The members were particularly interested in some of the newer or little known ornamental trees, shrubs and herbaceous perennials. Particular attention was called to two native perennials as yet not much known to cultivation, *Echinacea angustifolia*, the pale purple cone flower with its numerous large heads of pale purple flowers resembling *Echinacea purpurea*, except for the paler color of the flowers and the much narrower leaves. This plant has a tuberous root, which is collected and used in medicine; and *Pentstemon laevis*, whose spikes of white flowers make a very attractive mass. The two would form a very attractive combination if planted together, as they are of about the same height (2½ to 3 feet) and blooming at the same time. Another attractive perennial for foreground planting which was generally admired is *Achillea tomentosa*, a plant about 18 inches high with small, very pale yellow flowers in large flat corymbs. The rose garden with its many varieties of roses in bloom was another interesting feature of the morning's inspection.

It is felt that these outdoor meetings during the Summer months have unusual educational value, giving the members an opportunity to observe what the other fellow is doing.

L. P. JENSEN, Cor. Secy.

WESTCHESTER AND FAIRFIELD (CONN.) HORT. SOCIETY

The above society met at Greenwich, Friday, May 13, with Harry Jones presiding. It was decided that the Dahlia Show already announced to be held on Sept. 14 and 15, should take place a week later, most of the members regarding the date too early.

Secretary Addor had on hand for inspection the stereopticon lantern that has been purchased by the executive committee for the purpose of giving illustrated lectures. This new addition is bound to be interesting as well as educational as many subjects, it is hoped, will be dealt with both along horticultural lines and others closely allied to it. It was voted to ask the Tarrytown Horticultural Society to join us again on our annual field day, the date of which will be chosen later.

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A member brought to our notice the fact that the National Association of Gardeners will hold its convention this Fall in New York City. He spoke of the various ideas afoot for entertaining the visitors and hoped that our society would come forward and act in conjunction with other neighboring societies for this purpose, so that the visitors may return home with lingering memories of the pleasant time they spent in our midst.

GEORGE HEWITT, Cor. Secy.

SEWICKLEY (PA.) HORT. SOCIETY

The regular monthly meeting of the Sewickley Horticultural Society was held on Tuesday evening, May 10, with a record attendance, which goes to prove that now that the season of actual gardening operations is at hand, the members are really interested, and that the society is serving a useful purpose in the community. Many questions were asked by amateur members, concerning the cultivation of dahlias, which speaks well for the forthcoming Dahlia Show, which is planned to be the largest and most comprehensive ever attempted in Sewickley and will place Western Pennsylvania on the map as a dahlia growing section.

Exhibits both for the monthly competition and exhibition not only were more numerous than for some time past, but especially so in the amateur class, this being the first of the monthly competitions that are being conducted for amateur growers during the Summer months. President Carman appointed Messrs. Bensey, Barnett, and Catre the judges of the evening.

At the request of the members of the Allegheny County Garden Club, it was decided to set the date of the Dahlia Show from Sept. 29-30 to Oct. 6-7, so that members of the Club would be better able to attend.

HENRY GIBSON, Assist. Secy.

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Joliet, Ill.

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THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

If any of our readers can tell us where Gunnera can be obtained in this country, will they kindly address the Questionnaire?—Can.

I have a large triangle here I am going to plant in Vincas in the mass with a border of Coleus on outside. Could you please inform me how to plant them so as to leave no bare spots? I propose to plant the Coleus eight inches from side of triangle. Is that correct? If so, how far should the first row of Vincas be from Coleus. Would it be advisable to start from center of triangle or side?—W. J. McK., Kan.

Presumably it is the *Vinca rosea* which is to be used in the triangular bed, and the space usually given for massing is one foot apart, therefore the first row should be one foot from the Coleus, and by planting each row one foot from the preceding one, a finish would be made in the center without any bare spots. As it is a tropical plant it is the general practice to start seeds not later than February and grow at a temperature of from sixty to sixty-five degrees so as to have strong plants in three-inch pots by the time it is safe to plant in the open ground. If smaller and more backward plants are used setting them out at eight inches apart would give a mass effect at an earlier date. This would, of course, also be the case however strong the plants were. In the case of a very large bed it would probably be found more convenient to start from the center so as to avoid stepping over the ground already planted.—A. S., N. J.

There is not a wood-cutter but knows that the weight of the ax and the swiftness of the stroke are what tell in the cutting of the tree; that the sharpness of the ax is nothing unless there be weight and swiftness behind it. There is not a man who would go into the wilderness expecting to clear his farm with sharp-bladed penknives or well-polished scissors. Yet the same men, as they look around for their heroes, or as they give votes, are as likely as any men to be misled by the brilliancy of accomplishment, and to forget the necessity of the weight and force which belong only to character.—E. E. Hale.

Here and There

VALUE OF FALLEN LEAVES

Decaying leaves provide one of the finest top-dressings one could desire for shrubs, especially those of an evergreen nature, such as the *Rhododendron*, *Azalea*, *Kalmia*, *Camellia*, etc., whose roots are fond of surface nutriment. I know of no shrub or tree which does not derive considerable benefit from a top-dressing of decaying vegetation, into which the lowest branches, if they touch the ground, layer themselves freely. An example of this occurred here. An extensive plantation of *Laurustinus* (*Liburnum tinus*) was encroaching upon the paths to such an extent that restriction became necessary. As the work proceeded it was found that, without exception, the

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lower branches had rooted into the layer of decaying leaves which had been left undisturbed. Scores of these rooted plants were revelling in this layer of spent leaves. These will be lifted and planted in the nursery for future use.

Gardeners usually despise a bit of rotten wood as being liable to set up fungus among fruit and other trees, but I think this supposition is open to question as a great many shrubs are seen to feed ravenously on rotten wood, the little fibrous roots eating into its very core until none remains. On examining the vigorous young roots of this *Laurustinus* it was found that they had penetrated through the white patches of fungus, which, instead of weakening them, had increased their vigor and apparently helped their rooting. This shows how root action is increased and the roots in frosty weather protected.

Sir Herbert Maxwell, writing in one of the gardening papers, deprecates the practice he saw in one of our great London parks recently, and this is quite a common one in many of our gardens, where men were clearing all the leaves from beneath the shrubs as—to use his words—scrupulously as a housemaid cleans a grate. This foolish practice arises from the anxiety of gardeners to keep places tidy, and the fear of being brought to book if this is not so.

It is a mistake to clear away fallen leaves from flowering shrubs as we often do, leaving the surface quite bare. If such leaves must be disposed of it is far better, in the case of choice shrubs, to cast a few shovelfuls of fine soil over them to keep them down. This clearing away of valuable plant food takes up a lot of time which might be devoted to work of much greater importance. Anyone possessing groups of peat-loving shrubs, especially where these are carpeted with Snowdrops, Crocus, Daffodils, and other Spring bulbs, should scatter any surplus soil they may have—or even fine ashes—over the surface of the soil. The leaves so buried become in due course an excellent rooting medium.—Gardening Illustrated.

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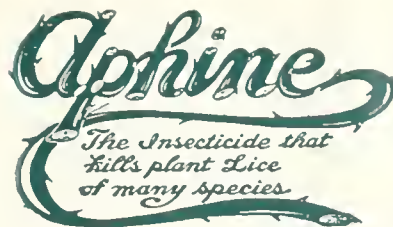
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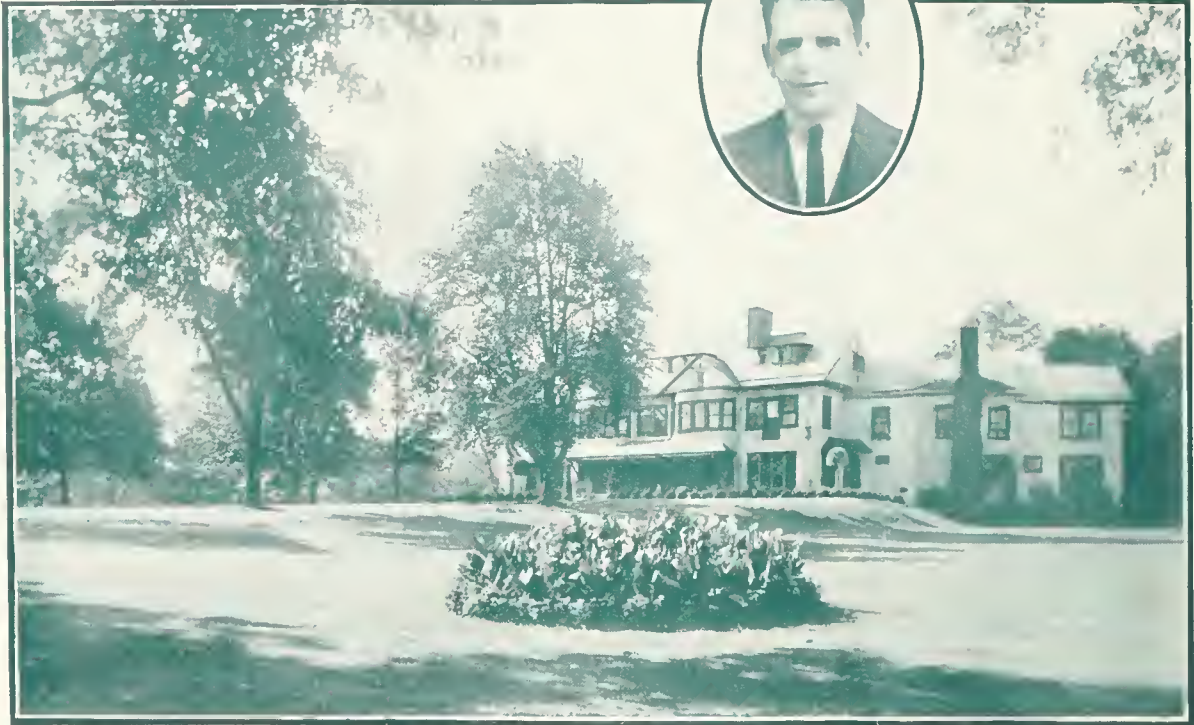
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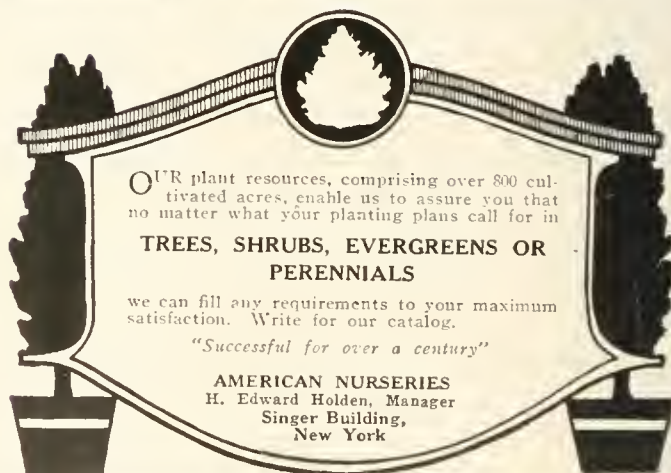
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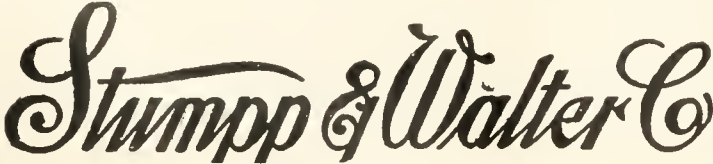
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(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

JULY, 1921

No. 7

Things and Thoughts of the Garden

MONTAGUE FREE

THE present is perhaps as good a time as any to continue the discussion of the lesser-known rock plants, so we will proceed to give a little more attention to some of those that, for lack of space, were unceremoniously dismissed with few words in last month's article.

The Sandworts are fairly well represented in Northern and Alpine regions. The Mountain Sandwort, *Arenaria montana*, perhaps the showiest of the genus, and certainly possessing the largest flowers, cannot be considered as a lesser-known rock plant, for it is widely grown both as a border plant and in rock gardens. But there is a species, *A. groenlandica*, not so well known, that is found on mountain summits in Eastern North America, Greenland and Labrador and other cool localities that should be in every collection. It forms tiny bright-green cushions made up of tightly packed shoots clothed with narrow leaves. The flowers are white and freely produced, and attain a height of two or three inches. It is supposed to be an annual, but comes up from year to year in pots in the cold frame without any particular care. Strangely enough, considering its habitat, it seems to require some attention in order to maintain it in the rock garden. A similar species is found in Scandinavia and goes under the name of *A. norvegica*. This, according to our recollection, forms looser tufts than the preceding, but is equally dwarf and has somewhat larger flowers. Under cultivation it seems to become an annual in habit, although it is described as being a hardy evergreen. We had it growing in the rock garden here for several years in succession, but it has not showed up this season. Whether it took offense because of being neglected or whether the mild Winter was inimical to its constitution, it is impossible to say. It is worthy of more attention than it receives from us, but when a plant here shows signs of being able to care for itself it is allowed to do so and available labor is concentrated on the less capable and more miffy plants.

The most desirable member of the genus from the gardening standpoint does not take at all kindly to our climate. This is a southerner from the Balearic Islands, *A. balearica*. It forms a living cloth of brightest green, mantling the rocks, and, in Spring, is spangled with innumerable tiny white blooms which seldom attain a height of more than an inch or two. In England, in many rock gardens, it is looked upon as a weed, albeit a beautiful one, so rapidly does it take possession of the quarters assigned it, and those of others in the bargain. Here in Brooklyn it has survived Winters when carried

over in a cold frame—not in the pans of soil in which it was planted, but in the surrounding ashes to which it had rambled. As a general thing plants that are not hardy should not be allowed in the rock garden, but the Balearic Sandwort is so intriguing in its green and pearly beauty that an exception must be made in its favor. It can be raised from seeds sown in February in a cool greenhouse and transferred to the rock garden in April, where it should be planted in stony soil on the north side of a rock so that it may be encouraged to ramble in characteristic fashion.

* * *

So far as is known, not much has been done in North America with the alpine representatives of the Wind-flowers. The most delightful of these is *Anemone vernalis*, and we take the liberty of quoting, in part, Farrar's description of this wonderful little mountaineer as given in "The English Rock Garden": "It is on the highest alpine grasses that you will come upon the Lady of the Snow. Spread out flat upon the ground, still sere and bare with the passing Winter, lie pressed the two or three carrotty leaves, more coarsely and sparingly cut than in any Pulsatilla; next, an inch or two of stem; shaggy with fur of bronzy gold, a fluffy frill of the same, and then, almost sitting upon the moor, like some mystic water lily, a great goblet-shaped flower, staring up to the sun, white as an opalescent pearl within, and tasseled with fire, while the outside of the pearl is a-shimmer with gold and violet silk, iridescent as it catches the sun in countless shifting shades of lilac and milk. * * * At the same time, truth must be told: in lower stations, and in later stages, the stem is longer, and the blossom looks correspondingly smaller; worst of all, the Lady of the Snow clings so desperately to her departing beauties that she will not let them go, nor confess to growing old. The blossom fades, but never fails, the pearly skin turns into a withered hag's, till in the end that once peerless loveliness takes a blowzy and disreputable look, like some raddled and unreverend dowager in a chestnut wig; while her cousin, *Alpina*, more wise, is advancing honestly into the full beauty of old age, and reaping the reward of its honorable silver heads."

It has the reputation of being a rather hopeless "miff," but this Spring we have raised some strong seedlings which appear to be quite comfortable and look as though they might bloom next year. It is advisable to knock wood at this juncture, as one can never be sure of the behavior of some of these cantankerous alpinists.

A. alpina, a species with large, white flowers, found on limestone soils, and its variety *sulfurea* with yellow flowers, found on the granitic ranges, are worth trying for. These, like *A. vernalis*, can easily be raised from seed, provided that it is fresh and sown as soon as possible after ripening.

The Anemone most likely to make an appeal to general plant lovers, as distinguished from those who have been badly bitten by the alpine bug, is *A. blanda*. This is a species from the Taurus Mountains and Greece, six inches or so high, with flowers similar in general appearance, though with no botanical affinity, to those of the Marguerite. The color ranges from white to pink and blue. Its time of blooming does much to commend it, for it is one of the earliest Spring flowers, in favorable seasons opening its blossoms in early March. It has tuberous rootstocks, which we used to be able to import, but now we must rely on the somewhat tedious method of raising it from seeds.

* * *

When thinking of species of *Aquilegia* for rock garden planting, the first thing that comes to mind is the glorious Rocky Mountain Columbine, *A. carulca*. It may be questioned whether this has any right to be considered as a little known rock plant, but we think it has, for the plants commonly grown in gardens as *A. carulca*, usually have in them a mixture of foreign blood. The true *A. carulca* in its best form has numerous flowers of pure white with sepals of pale blue. In raising it from seeds it is better to rely on stock collected in the Rockies rather than to use seeds gathered from garden plants which almost invariably have been cross pollinated with other species.

The most distinct Columbine is the Japanese *A. flabel-lata* and its garden form *nana-alba*. Their peculiarly shaped white flowers, glaucous foliage and dwarf habit, single them out from the rest of the genus. This species does not appear to cross fertilize so readily as the rest of the genus and seeds may be usually relied upon to come true.

* * *

It appears that nobody loves the Sedums, or is able to get enthusiastic about them. It is true, the genus as a whole is awfully homely; the flower coloring is not brilliant—the pinks and reds are washy, the whites dingy, and the yellows usually seem to have a tinge of green in them. The habit of growth is squat, corpulent, and stodgy, but, it is a genus that is useful, a characteristic perhaps of homely things, and is admirable for filling in places in the rock garden where nothing else will grow. And there are a few species that stand out from the common ruck with almost an air of distinction and these, strangely enough, are seldom seen in gardens. There is the annual *S. caruleum*, with starry, pale blue flowers, useful for filling in patches rendered vacant by the dying down of Spring bulbs, or *S. hispanicum*, another annual, with attractive blue green, glaucous foliage. The biennial *S. sempervivioides*, is unique amongst Sedums in its habit of growth and in the determined bright scarlet of its flowers. It is well named, and successfully imitates a Sempervivum in its rosetted habit of growth. It may not be able to endure our Winters, but, being a native of Asia Minor and the Caucasus Mountains, it should stand a fair chance of survival if planted in a dry spot.

* * *

The Houseleeks share many of the characteristics of the Sedums. The species that stands out from all the rest is the Cobweb Houseleek, *Sempervivum arachnoidum*. This has the tips of its leaves connected with strands of a cob-webby substance which gives it a unique

appearance. In the center of the rosettes the "cobwebs" form a dense mat which is an effective waterproof covering. Whether this is of any importance in the plant's economy in preventing the access of water and consequent rotting of the heart it is difficult to say. The rest of the Sempervivums get along well enough without it and *S. arachnoidum* itself doffs its overcoat in Winter—the time when one would think it most needful—and carries on as a tight little bundle with leaves closely appressed towards the center of the rosette. When the corpulent flower stems appear in June with their leaves decked with cottony festoons, it is one of the most striking objects in the garden and, when the brick-red flowers develop it is still more attractive. Robinson states that "About London it sometimes suffers from sparrows plundering the down"—presumably for house building purposes. This is an addition to the already long indictment of these pesky birds. Up to the present, the Brooklyn sparrows have not got on to this little dodge and we hope that there will never be another immigrant London sparrow to corrupt their morals in this respect.

One of the most interesting Houseleeks is *S. soboliferum* probably often sold under the name *S. globiferum*. This is peculiarly well adapted for travelling. The numerous offsets are produced well up on the parent rosette and are almost spherical. They sit tight close to their parent until the slender attachment gives way and then they roll off, often to a considerable distance if situated on sloping ground, and are ready at once to start a new colony.

All of the hardy Sempervivums may be considered as being good rock plants, even the common Houseleek, *S. tectorum*, is distinctive, especially when perched upon a barren rock, apparently disdainful entirely of such questions as soil supply which bulk so largely in the requirements of most plants.

* * *

We are unfortunate here in the North to be deprived of the pleasure of growing out of doors the dwarf shrubby Veronicas such as *V. cupressoides* and *V. lycopodioides*, which by their cheerful green coloring add so much to the Winter appearance of rock gardens situated where the seasons are less severe. But we can make good use of the herbaceous kinds and there are many that are suitable for rock garden planting. The creeping habit of *V. repens* makes it valuable for planting in between the rocks of stepping stone walks, for even when in bloom it only attains a height of an inch or two. In early Spring the foliage is almost completely obscured by the pale pink flowers, usually touched with blue.

Another prostrate species is *V. pectinata* which is a larger growing plant but of a less vigorous constitution. It has grayish leaves, and dark blue flowers with white centers. There is also a variety *rosea* with rose pink flowers. The best of the hoary leaved Veronicas, however, is *V. incana*. The white-woolliness of the leaves of this species is fully equal to that of any of the "Dusty Millers," and when they are surmounted by the one-foot spikes of bright blue flowers the ensemble is decidedly pleasing.

There are several dwarf or prostrate forms of *Veronica*, supposed to be varieties of *V. teucrium*, sold under such names as *prostrata* and *rupestris*. These are all good, especially the latter, of which there are several color forms. But the best of them all is an extremely diminutive form with bright blue flowers, whose full name we suppose to be *Veronica teucrium*, var. *prostrata nana*. This is not commonly seen but it is worth striving for in spite of its name which after all, can, for garden purposes, be abbreviated to *V. nana*!

The Queen of the Night

DR. E. BADE

OF wonderful form and great beauty is the night flowering *Cereus* commonly known as the "Queen of the Night," whose great variety of flowers in the sunny South few men are able to appreciate.

In Central America, their native country, these cacti crawl like snakes covering boulders and trees alike with a seemingly dead and dried-up network of thorn-covered

at noon at which time it begins to pulsate and, by a peculiar twisting motion loosens the sepals. These slowly increase in size, and, during the latter part of the afternoon, begin to open. Then when it is dark and the short twilight has faded, and the stars have made their appearance one by one, this gigantic flower is fully opened and reveals its golden colored crown to the cool breeze. But the flower remains open only until midnight when its splendor begins to wane and the early morning hours find it faded beyond recognition.

Not only one flower begins to open during the afternoon, but many. Since the hot season has prevented the cactus from growing, it awakes from its forced Summer rest to a new and vigorous life. One of these gigantic *cereus* flowers has a diameter of one foot, and a weight of two and a half pounds. The strikingly white petals can be seen from a great distance and the heat that one of these flowers gives off can be felt on the cheek. Another *Cereus*, *Cereus grandiflorus* has a strong odor of vanilla which is scented far into the air.

All these characteristics are not useless to the plant. Since they only bloom one night they are largely dependent on insects for fertilization and so their bright white



Cereus MacDonaldae 5:50 P. M.

branches. The tropical sun has nearly burned them up and the hot winds have drawn their last drop of moisture so that they cling tenaciously, with aerial roots, to their support.

As soon as the rainy season sets in, they drink their fill. The leafless network swells, and new life enters the plant. This season lasts only for a comparatively short time, and therefore the plant must use it to its best advantage. Buds quickly appear on the joints, some of them as large



Cereus MacDonaldae 6:50 P. M.

and round as marbles, others resemble the artichoke, and, as in the case of *Cereus triangularis*, attaining that size. Some of the buds are small and round, others larger and longer, still others are ready to burst open to-night and some will open tomorrow.

The bud that opens in the evening gives signs of life



Cereus MacDonaldae 7:50 P. M.

petals, or their far reaching and penetrating perfume, attracts them. These night flying insects (*sphingidae*) hover around the flowering plant, dip their long curled up trunk into the nectar, and pollinate the flower unconsciously.

The heat produced by the flower keeps off the night dew, thus protecting the pollen, for the night is cool to such an extent in the tropics that a thin sheet of ice can often be detected on standing water. The size of the flower and the large number that bloom prevent the plant from producing heat for a prolonged time.

The great varieties of *Cereus* seldom produce flowers in the hothouse. It is commonly supposed that they bloom every seven years, but this is a mistaken idea since the way in which they grow affects them most.

Sloth makes all things difficult; Industry, all easy; he that rises late must trot all day, and shall scarce overtake his business at night; while Laziness travels so slowly that poverty soon overtakes him.—*Franklin*.

Native Bulbs for Mass Planting

HERBERT DURAND

THE continued high prices and limited supply of Hyacinths, Tulips, Daffodils and other imported bulbs, make it well worth while to consider the relative merits and beauty of such lovely things as our native Mertensias, Lilies, Shooting Stars, Trilliums, Trout Lilies, Mariposa Tulips, etc. These gems of our American flora have been overlooked and neglected in this country, but in Europe they are held in equal regard with the so-called Dutch bulbs, and some of them are considered by European growers to be even more exquisitely beautiful. As a rule they are of the easiest culture and increase rapidly from year to year, while the initial cost is much less than that of their rivals from across the Atlantic. The varieties described in this article are particularly well suited for naturalizing and mass planting, and many of them thrive in locations where Dutch bulbs will not.

I have a strong personal liking for the Erythroniums, commonly called "Dog Tooth Violets" or "Adder's Tongue." John Burroughs strenuously objected to these popular names, saying that the plant was not a violet, nor did its flower bear the slightest resemblance to either a Dog's Tooth or an Adder's Tongue. His name was "the Trout Lily"—because of the beautiful mottling of the leaves like that on a brook trout's back; because the plant is at its best along the banks of trout streams, and because it is a true lily. It is to be hoped that the name "Trout Lily" will soon and permanently supplant the two other misnomers. In the Eastern United States, there are only two species of Erythronium and of these two, *Albidum*, with white flowers, is somewhat rare. The common kind is *Americanum*, with golden yellow blossoms. In the far west, however, there are a number of other species, all of exceeding charm and in a bewildering variety of colors. *Californicum* is of the same bright yellow as our eastern sort, but bears three and four blossoms on the stem instead of one, like ours. *White Beauty*, a variety of *Californicum*, has white flowers with crimson centers. *Hendersonii*, is of a pleasing shade of purple, and *Johnsonii* is a bright, rosy pink. Erythroniums are perfectly hardy even in the coldest sections of the United States, and while they are at their best in rich, moist leaf mold, they do not seem to object to any ordinarily fertile soil, provided it is reasonably light and fairly well drained. In woodland or shaded spots anywhere, are the best places to naturalize them, and if planted in liberal quantities, they will soon literally carpet the ground.

If they had no other attraction than their richly mottled leaves, they would be well worth using for this purpose. Our eastern species is a shy bloomer. In a mass of hundreds of plants in early Spring, there will be perhaps not more than ten or a dozen blossoms. The western kinds, however, bloom abundantly, and it is estimated that as high as 75 per cent of mature bulbs will blossom each year. They should be planted during September or early October, setting the bulbs three or four inches apart and covering them with two or three inches of soil.

Mertensia virginica, like the Erythronium, has two common or popular names—"the Virginia Cowslip" and "Blue Bells." It is also known in some localities as "Lungwort." It is a first cousin of heliotrope and the forget-me-not. The trumpet shaped flowers are one to one and a half inches long, in a loose raceme of six or more, at the summit of a stem from one to two feet high. The flowers open a bright pink which soon changes to a clear azure blue. Shortly after blooming, the foliage

turns yellow, withers, and disappears like that of the oriental poppy, and the roots lie dormant during the Summer and Fall. They may, therefore, be planted any time after mid-Summer. Mertensias grow naturally along the banks of streams and in the alluvial soil of low lying grounds anywhere. They seem to thrive well, however, in almost any locality, provided the soil is rich and reasonably moist. They are prolific seeders and increase very rapidly. I know of no blue flower that is more beautiful. *Dodecatheon meadia*, known as the "Shooting Star" or "American Cyclamen" grows most abundantly in the Middle West. It is found, however, as far East as Harrisburg, Pa. It is an exceedingly handsome plant, sending up a wiry stem about a foot high, which bears a many-flowered umbel of bright pink or rose colored blossoms like miniature cyclamens. The leaves of the Shooting Star persist longer than those of Mertensia, but like the latter, disappear by mid-Summer. The dormant roots may be planted any time during Autumn, and my experience is, that they do best on a northerly slope in at least partial shade. They should be planted so the crown of the roots is at or very near the surface of the ground.

The Trilliums, or "Wake-Robins," have very few rivals among our conspicuously beautiful woodland plants. Probably the best kind for general purposes is *Trillium grandiflorum*, usually called the "Great White Trillium." This plant grows a foot or more high and the large blossoms turn pink with age. A colony of several hundred or several thousand of these wood lilies makes a most striking display in late April or early May. The Painted Trillium, *T. undulatum*, has frosty white fluted petals with crimson stripes at the center, undoubtedly the handsomest flower of any member of the family. Unfortunately, however, it is a denizen of cold, moist woods, and is extremely difficult to establish in new quarters. *T. sessile*, from the Pacific Coast, is perhaps even better than *grandiflorum* from the standpoint of easy culture and permanency. Its flowers are snowy white and sweetly fragrant. Another excellent and attractive sort that is not difficult to grow is *T. stylosum*, from the Blue Ridge Mountains. It has very attractive pink flowers. The common red trillium of our eastern woods is also a good and easily established companion for the other kinds and gives a color variation that is very pleasing. I find that all the Trilliums prefer a shaded location in rocky soil that is rich in leaf mold and does not suffer from lack of moisture. The bulbs or corms should be planted deeply, from four to eight inches below the surface.

The *Calochorti* or "Mariposa Tulips," of the far West, have never been given the consideration they merit at the hands of eastern gardeners and estate owners. Until one has seen a collection of these wonderful plants in flower, he can form no conception of how much Nature can accomplish in the way of wide variety of color in the blossoms of a single kind of plant. There are six distinct strains of the Calochortus and about the only characteristic that is common to all, is the cup shaped flowers, which come from one to six on a stem. Each strain has evolved a color scheme of its own, and its blossoms are so wonderfully marked with peacock-like eyes, blotches and pencilings in the richest colors, that only a rare collection of Orchids can vie with them in their marvelous variability of beauty. There is no better investment for a flower lover than a quantity planting of these superb

(Continued on page 653)

The Effects of the Freaky Winter and Spring Upon Certain Perennials

FRANK B. MEYER

IT is easy to remember how severe was the Winter of 1917-1918. At the Ohio Agricultural Experiment Station, near which the writer was then living, nearly all rose plants, including the most resistant of the hybrid perpetuals, were killed back almost to the ground, while very few of the hybrid teas survived at all, even though they were well covered with earth. It was then that Leonard Barron wrote: "Last Winter was the greatest vindication of *hardy* plants and shrubs, particularly peonies. Their profusion of bloom last month was unquestionably due to the thorough rest of the roots last Winter and perfect maturity of plants last Fall."

Perhaps it was the complete rest, so long uninterrupted, that caused the peony to bloom so well that season. The fact that certain plants of the temperate zone regularly pass a period of rest, preparation for which is begun, in most cases, even long before Winter is near, has recently been expatiated upon by Frederick V. Coville, in the *Journal of Agricultural Research*, XXII, Washington, D. C. The Blueberry, made the particular subject of the study, does not, however, as the editor of *The Gardeners' Chronicle* (British) points out, require the warning touch of frost in order to get itself into a leafless condition. It is true that plants kept continuously warm during the Winter start into growth later in the Spring than those that have been subjected to a period of chilling. Every gardener who forces rhubarb, for example, knows that previous exposure of the roots to hard Winter weather makes them more amenable to forcing.

These observations are not in contradiction to the precocity of blooming in the case of practically all outdoor flowering plants during the extraordinarily open Spring just passed. That the blossoms of all flowering plants, particularly those that bear blooms large in proportion to the size of the plant, like the peony and the bulbous plants in general, would have been better in every respect if the wonted Winter rest had been as sound as it ordinarily is, may be admitted. The observation is of interest; but it is of no great practical value, for the intensity of the Winter cold is obviously beyond human control.

There are certain points of more utility suggested by the behavior of certain flowering plants during the strange Spring. Some of these suggestions find their origin in the observations made by Europeans, for in England also the same kind of Winter and Spring was experienced. In *Gardening Illustrated* is found the following:

"The mild and sunny weather experienced during February and March resulted in many hardy trees and shrubs bursting into growth and flower before their normal time. During the early half of April many plants that really should be dormant until May opened their flowers, and blossoms were to be seen on every hand. Rhododendrons being especially prominent. Then, between the 14th and 24th, came bitterly cold winds, sunny days and frosty nights, with the result that not only were blossoms killed wholesale, but young shoots and leaves were shriveled up as if burnt. Great masses of Rhododendrons had not a single perfect flower left, the only existing blossoms being those on plants well sheltered and shaded from wind and bright sun. * * * Common trees, like Cherries, Crab Apples, and Plums, had their flowers injured both by wind and hail, whilst Lilac blossoms looked puny and pinched, the white-flowered varieties being browned. On many Magnolias every flower was killed, whilst leaves and young wood were crippled."

Immediately after this item occurs this note on *Iris Tolmieana*:

"This charming *Iris* is showing very well for bloom this year, the flowering stems being well advanced, though much before their usual time. In a family noted for the beauty of its flowers it is difficult to say which is the most beautiful; but this species can lay claim to being as beautiful as any, the soft lilac-grey color being very attractive. I find other early-flowering *Irises* very free-blooming this year, some of the clumps simply crowded with flowering stems."

The foregoing confirms what has been one most gratifying condition this year the country over. It is that the last Winter was the greatest vindication of the *Iris*. This is particularly gratifying on account of the amazing increase in popularity of this plant, so wonderfully improved in the last few years. Never before, seemingly, has there been, except, possibly, the fibrous-rooted kinds like the Japanese, greater profusion of bloom or longer continuance of it. Not only did they begin to blossom early; they delighted the rapidly swelling ranks of the enthusiasts a very long time also. *Aurea* was in flower, in the latitude of Philadelphia, till June 20, and it was even surpassed by the new yellow Virginia Moore, which, if it shows improvement in no other respect over the other yellows with which it is practically identical in appearance, may prove permanently to have the merit here accredited to it. Nor did the quality of the flowers seem to be impaired by the trying weather, with its queer extremes of unseasonable heat and cold. Finer flowers than those of *Ambassadeur* this year, or of *Halo*, *Lady Foster*, *Lent A.*, *Williamson*, *Neptune*, *Pallida delmatica*, *Queen Caterina*, *Souvenir de Madame Gaudichau*, or, according to reports, of *Dominion*, could not be imagined.

In the matter of tendency toward root-rot alone did the tall bearded *irises* seem to suffer from the sudden changes of temperature and the persistency of cold rains rather late in the Spring. But this one serious failing of the plant students are learning to combat and a friend of the writer seems at least almost to have won the battle in ways that he expects soon to publish.

Another lesson derived from experience with weather so extraordinary is suggested by words in *The Garden* for May 7:

"I have been greatly puzzled during this Springtide to account for the quantity of rock plants that have been wiped out. Not only plants that one looks upon as true alpine, but the ordinary hardy subjects that generally prosper under all conditions, such as *Heucheras*, *Saponarias*, *Thymus*, *Saxifraga hostii*, *Dianthus*, *Geum montanum* and *Corydalis*. Recently I received a copy of the *English Herald Abroad* (a paper printed in Montreaux), and here I think my difficulty is solved. The name of Mr. Henri Correvon of Geneva will be known to readers of *The Garden* as one of the greatest living authorities on alpine plants and gardening, and in an article in this paper, 'The Plants of the Alps in Our Gardens' Mr. Correvon says, and to me it came somewhat as a surprise: 'And yet, notwithstanding the surprising nature of the affirmation, it is certain that the moist and maritime climate of England offers advantages over our own lowland climate' (i. e., Geneva) 'which is drier and too Continental.' The article, the second of this series, is full of valuable information. But is not this the cause of all my present trouble? During the Spring and early Winter we have had very little rain, and strong drying winds, and I feel convinced that this unusual loss of hardy plants has been caused by the extremely mild Winter, aided by 'drying, withering atmosphere of the plains.'

"Further, turning up an old book of notes upon the alpine flora of the Himalayan district, I find this extract from Hooker's Himalayan journals: 'On the boundary of Sikkim and Tibet 15,745 feet above sea-level. Here the slopes exposed to the south winds are bare, while toward the north, the yellow Cow-

slip, *P. sikkimensis* gilded the marshes. *Caltha scaposa* is very abundant. *C. palustris* is not found in Sikkim. Anemones, *Potentilla*, *Draba*, *Saxifraga*, *Arenaria* and other alpine plants are abundant. Truly, it is another case of 'killed by kindness,' for are not all my losses caused by the south wind and the long continued drought?

"A few years since, when we had frost for a considerable duration, registering 22 degrees, and snow, I lost comparatively few rock plants."

This may, at least in part, explain why in the garden in which the writer has made most of his observations this year the peonies did so much better than they did in any other site near. They were sheltered, somewhat, from the west winds by tall trees. They have here, in a situation well drained but lying rather low, a soil that is solid and not readily dried. Then they have been carefully groomed also, to use a term employed in connection with competitive exhibitions of character quite different from that of peony shows. That these very plants have borne the blooms which in recent years have captured the most coveted prizes at the national exhibitions indicates that they are in good general condition.

But they have differed, one from the other, in their blossoming this year. The conclusions derived from their behavior during this one most trying year may not be altogether dependable; but they are possibly worthy of attention and may be of some guiding value.

As might have been expected, those that endured best the idiosyncrasies of the unnatural Winter and Spring were the reds. Even Richard Carvel, like the *officinalis* varieties, was undaunted by the two periods of late severe freezing that corresponded to the two mentioned in the article quoted above. It thoroughly demonstrated its value as the best early red, of shade just as pleasing as ever before, with its characteristic fragrance and of size apparently not affected by the ordeal to which its blossom buds had been subjected. Somewhat reduced in size of individual blooms and in general display was the one so admired for its dark and rich maroon, Monsieur Martin Caluzac; several of the terminal buds on each plant were much injured by the late frost so that they gave way to the laterals. This, by the way, was the almost universal case with peonies this year; in dis-budding, even when the terminal bud gave promise of making a flower, it seemed best to allow one of the laterals, which had suffered less through developing later, to take all the strength of the stem. Madame Gaudichan, of color nearly as dusky as the preceding, did not perform well either this year; but it is habitually a trifle shy. That extensive new French prince among the reds, Philippe Rivoire, was similarly unsuccessful in attempting to vaunt himself. But with these exceptions all varieties of the color proved their worth as resisters of untoward Spring weather. Karl Rosenfield, William F. Turner and Adolphe Rousseau formed good blooms; Old Silver Tip and Longfellow not quite so good. Much better, though, than these last two products of the north were two others from the same source, Lora Dexheimer, not regarded as a reliable bloomer nor as a good grower, and Mary Brand, of a particularly pleasing shade.

And that brings up another point of freakiness; some varieties, of other colors, among the seedlings that have come out of cold Minnesota, endured less well the late freezing in the Spring than did many from sunny France and from England, whose Winters are regularly much milder than ours. Martha Bulloch, Chestine Gowdy and Judge Barry made no approach at all toward their celebrated magnificence. The terminal buds of the first two swelled out large and plump; but they failed to develop blooms at all creditable. The last is an early variety. All but two of the terminal buds on the large show plant were shrivelled by the late freezing and even the laterals failed to recover.

On the other hand, a few of Kelway's, Lemoine's and Dessert's, of the daintiest coloring even, bloomed with surpassing loveliness. Of Lady Alexandra Duff had never before been seen more blossoms, nor larger, nor better in color, nor more fragrant. Yet Loretta Pfeiffer, an American product, of somewhat the same order, was not greatly outdone. It is one of Brand's that is going to be highly estimated when it becomes better known. Of others of foreign origin the most refined came out of the trying ordeal with their customary exquisite daintiness. The flowers were not so large, nor so full, nor so many as usual upon Madame Jules Dessert, Marie Crousse, La Lorraine, Rosa Bonheur, Rachel (Lemoine) and Madame Auguste Dessert; but they were certainly charming and as surely appreciated in this season of so few perfect peony blooms. Tourangelle fell somewhat short, especially in point of size. Therese formed the notable exception. This Queen of Peonies evidently disdained the mild ease of the time of the year when the elements are regularly more rigorous and was troubled by the unrest. She may be pardoned this once, for she is so reliable. Of the older kinds that rank with these newer gems the following performed splendidly: La Perle, Octavie Demay and Reine Hortense.

In class with the dainty Europeans just mentioned is the American Walter Faxon. Its pre-eminently exquisite coloring has never been better than it was this year and its blooms were rather plentiful, though not quite of normal size. And several others of American origin did splendidly, so that henceforth, if the prediction be not too bold to base upon the observations of this one year, the name of Shaylor will be one for peony enthusiasts to conjure with. Jessie Shaylor, Georgiana Shaylor, Mary Woodbury Shaylor and Frances Shaylor made a quartet this season truly lovely. One of Shaylor's great prize winners, however, the famous Mrs. Edward Harding, behaved no better than the other whites; they all did poorly, with the notable exception of Frances Willard, besides Frances Shaylor. The old dependable *Festiva maxima* did only fairly well, while Madame de Verneville and Madame Emile Lemoine made almost complete failures. Mont Blanc, of course, showed this year only wretched apologies for blooms that opened only less disgracefully than did those of L'Indispensable, a pink variety of the same provoking character emphasized. Mireille naturally was not conspicuous for much better deportment. Grace Loomis, represented only by small plants, gave promise of being a great improvement. Baroness Schroeder gained no credit to itself, nor did the aristocratic Glorious, nor even Le Cygne; the exhibition plant of this a year ago bore the champion blooms of the national convention; but this time it could bear but a few flowers, each showing only half the wealth of lovely fluffy whiteness in front of which no competitor less than twelve months before had been able to stand. The good later-blooming whites, Albatre and Enchantresse, developed fair blooms, but all from lateral buds.

Le Cygne, like many others that succumbed, would have come through a little more successfully, of course, if it had been willing to give its exhibition later in the season. It was obviously due, in the main, to such cause that Sarah Bernhardt, Madame Emile Galle and Milton Hill were distinguished by their success. They all bore, each one, finely characteristic blooms, the first with extraordinary prodigality. The last demonstrated very conspicuously the freakiness of the season by being at its best as early as the day after Memorial Day. For another late-flowering variety, however, the grand Solange, the season was disastrous; its petals are of such substance, and so compactly folded in the bud, that they often develop with great difficulty, even in favorable

seasons. Herein lies the hint that the normality of flowering on the part of the singles and the Japanese varieties, and on the part of many of the tree peonies even, although they are so very early, as is well known, may be accounted for by the looser structure of their buds. This may explain the fact also that Primevere, so highly esteemed for its lovely yellow center, gained this year added merit by safely carrying its terminal buds through the freezing and by expanding them as successfully as did any red; it has not very compact form. Its rival for rank as the nearest approach to a yellow peony, Laura Dessert, has fuller blooms. It failed altogether to carry its terminal buds through. But it is earlier than Primevere and in a normal season would not suffer so much in competition.

The good strong red-flowering sorts have been referred to as having been, as a class, most nearly normal. But they were not greatly surpassed by the good strong pinks, particularly those of full and rather flat rose type, like La Fee, Etta and Sister Annie. Fortunately for the mass

of peony growers the two other rich pinks that are so commonly found and so deservedly given a place in almost every collection, *Edulis superba* and Monsieur Jules Elie, proved to be quite resistant to unfavorable climatic conditions. This is all the more remarkable in view of the fact that they, fully double in form of bloom, are early varieties, the first being the earliest of all tolerably good pink varieties.

Now, just as these words are being written, upon almost the last day of June, the freaky season, strangely conglomerated from untimely warmth and untimely cold, persistently chilling rain and excessive drought, is being brought to a close by a farcical performance, as it were, of two members of the troupe whose performances have been passed in review. A plant of Claire Dubois, and one of Helen Wolaver, the latter probably the latest to bloom of all herbaceous peonies, is each bearing a bloom two months after Richard Carvel and the *officinalis* tribe ushered in with their brilliant beacons, the time of peonies.

Half a Dozen Hollies

C. H. CHESLEY

THE hollies, of various species, are not so common on our lawns as their beauty and usefulness would seem to warrant. We usually think of holly as a necessary part of Christmas decorations but there are few who have learned how beautiful the native *Ilex opaca* is as a tree or shrub for the lawn. This species, universally known as American Holly, was originally found as far north as Maine and still occurs near the coast in Massachusetts and is more or less common throughout the Central and Southern States. It is the species par excellence for lawn planting and will be found hardly everywhere except in the arid plains section and the bleak Northwest. In favorable localities this species becomes a tree approaching fifty feet in height.

The Christmas supply of holly was formerly obtained largely from the pine lands of New Jersey, where *Ilex opaca* once grew in abundance. Most of the supply now comes from farther south, where it is still found in great quantities. This leads us to wonder if the time will come when the available supply of wild holly will be exhausted.

For single lawn specimens, select small regular-growing bushes and set in the Fall or early Spring. A good rule to observe in taking any wild shrub from the woods is to set it in the same way in its new home as it stood in the old with regard to the points of the compass. Thickets of holly are very attractive if there is room on the lawn. Other wild shrubs may be intermingled with good effect. For this purpose the native Juneberries, Hawthornes, wild cherries and mountain laurel are suggested. Red cedar and hemlock make attractive evergreens for intermingling.

Ilex opaca is the only evergreen holly that will thrive north of New York. South of that point the European holly, *Ilex aquifolium* may be set in the ground with reasonable assurance of success. This is probably the prettiest of all hollies, the leaves being of shiny green color and wavy outline. This species of holly is largely propagated by the florists of Holland and much has been shipped to America and sold in tubs for Christmas decoration. It is native to England and the continent of Europe but the regular-growing specimens seen in this country are propagated in pots and tubs. You who live

south of New York should set your holly plant in the ground after it has filled its purpose in the Christmas festivities. If the ground happens to be frozen, keep the plant until Spring before setting out.

Two other species of holly are native in the Southern States and will withstand the climate along the coast as far north as New York. These are *Ilex vomitoria* and *Ilex Cassine*. The former is the plant from which the celebrated "black drink" of the Southern Indians was made. The natives of North and South Carolina still use the leaves of this holly to make a kind of tea much used among them. Both of these species are evergreen, but the leaves are not of so dark a shade of green as in the case of *Ilex opaca*. The berries are smaller and of a more brilliant shade of red.

There are three or four species of holly which shed their leaves during the Winter. These are all common and hardy in the North. Planted in thickets they are odd, yet at the same time attractive, and against a background of fir or spruce, they appear especially pleasing. Again they furnish an abundance of food for such birds as robins and blackbirds when most other sources of supply have been cut off. The lawn which has a lot of these shrubs will attract many birds and keep them even throughout the entire Winter. *Ilex verticillata*, known as black alder, is the most common. This bears bright red berries in great profusion, which remain on the bushes for some time after the leaves fall. A species very similar but bearing larger berries is *Ilex lœvigata*. In connection with this species, the Mountain Holly, *Nemopanthis mucronata*, makes a pretty effect, the berries being of a different hue. The Inkberry, *Ilex glabra*, bears black berries. The leaves of this are inclined to be evergreen. It is entirely hardy at the North, but requires a sandy soil for best results.

In transplanting our native hollies, it should be borne in mind that the flowers are in the class known to botanists as dioecious and some plants standing alone will not produce berries. It may be possible to find plants known to produce fruit, or several may be taken up and set in the desired location, then later all undesirable ones removed.

Rosette Plants and Others

WILLARD N. CLUTE

APPARENTLY the original form for the bodies of plants was an erect column. This, at least, was the pattern after which the great forests of the coal period were fashioned and it still persists in our arborescent vegetation. In fact, the chief distinction between shrubs and trees is that trees always have but one main stem rising from the ground while shrubs usually have several. As the earth has grown older, however, various modifications of the vegetation have taken place. One of the most important of these was the introduction of the herbs. Those who delve into the geologic history of the earth tell us that in the beginning the plants were prevailingly woody, and that it was only in comparatively recent times that the tender grass and other herbs appeared. A curious fact in connection with this is that herbs and herbivorous animals appeared on the earth together. In the great forests of the coal period there was abundant life, but it was not the life that lives by grazing; there was nothing to graze.

The period in which the herbs appeared, seems to have been one of rapid change. Evolution was in full swing and new species sprung up everywhere, struggling with others for a place to live and, if successful, fixing their particular types as component parts of the landscape. It was probably at this time that our flora gained the start in variety that characterizes modern vegetation.

One of the most interesting of the special forms is that kind called the rosette-plant. It is essentially the original columnar form in which the internodes or spaces between the leaves failed to develop. Often it further indicates the relationship by sending up an aerial stem after it has accumulated sufficient material for the purpose in the rosette form. Since room to spread out their leaves is an essential feature of the rosette-plant habitat we find the best examples in open places. Old fields, roadsides and gardens will yield excellent examples. The dandelion, evening primrose, thistle, shephard's purse, teasel and the plantain are of this nature. Some of these possess aerial stems and others never do. Open places are by their nature dry places and the drier the region the more numerous the rosette-plants until the limit of dryness is reached. The houseleek and yucca, both inhabitants of desert places, are characteristically compact forms produced by great heat, strong sunlight and lack of water. A large number of rosette-plants are also known as crevice plants from their habit of growing on cliffs where they send their roots deep into the cracks and crannies in search of the scanty moisture. Such plants are nearly always equipped with a strong central tap-root. Practically all the common garden plants whose roots or leaves we use for food are rosette plants with roots of this kind.

Invariable companions of the rosette-plants, are the mat plants. To the casual observer, there seems to be little difference between the two for both types spread out flat on the ground. The mat plants, however, as their name indicates, form mats often of considerable size and, to do this, branch extensively. Rosette plants, on the other hand, have such short stems that they are often spoken of as stemless. The two groups indicate very nicely the fact that there is often more than one way of doing a thing. The object of each is to spread out its green tissues to the light. Among the most pestiferous of the mat plants are the spurge, knot-grass, purslane, and spreading amaranth. In cold and very dry

regions, as on mountain tops, in the arctic regions, and on cliffs, occurs a variation of the mat plant known as the cushion plant. In this, the stems are very much dwarfed and thus form rounded masses which are very characteristic and conspicuous.

The various forms of vines are, as to form at least, closely related to the mat plants. They belong, however, to a different habitat for their peculiar structures would be of little use in the places where mat and rosette plants grow. Though they live in woods and thickets they do not appear to grow there so much because they have something to cling to, as because they have a form of stem which places them at no disadvantage among the others in getting up to the light. Unlike the mat plants, they seldom branch until well along in development and some do not branch at all. The vines range all the way from the morning-glory, hop, and cinnamon vine, to the grape and woodbine of our own woods and the giant tropical creepers with stems hundreds of feet long and more than a foot thick. The Spanish call these latter forms lianas, and this term is fast coming into use to indicate all woody vines and to distinguish them from merely herbaceous species. Lianas have four general ways of climbing: they may twine like the bittersweet, have tendrils like the woodbine, produce aerial roots like the poison ivy, or cling by recurved hooks as in the climbing roses.

WATER AND CULTIVATION

HAPPY is the grower who has ample means for watering his open air stock.

In times such as the present, when week after week passes without any material rainfall, outdoor stock is something of a gamble, and particularly so where the soil is of a light sandy nature. For many lines, a medium to light soil is an advantage; it is easily worked and encourages fibrous roots, but in periods of drought, the heavy soil is an asset, always providing that it is kept well cultivated.

Heavy soil not frequently hoed, and especially after a soaking rain or watering will crack and so lose vast quantities of moisture. Light soil, unless of a fine nature, does not run together so quickly, and therefore does not crack so readily.

But while moisture evaporation is less rapid in one sense, it is more so in another, inasmuch as light soil does not hold so much water in suspension; thus, even with cultivation, light soils feel the effect of drought severely unless, as is sometimes the case, the water level is fairly high.

Cultivation on all soils staves off serious effects, especially if the hoes or cultivator tools work fully three inches deep, but this cannot be done among small or newly planted stock.

Particularly is this so on light land, as soil falls away so readily. Because of this fact, a water supply is of utmost importance. There are some who argue that watering is of no service or that it is even harmful, and that cultivation persistently conducted will carry a crop through.

True enough, it will, and when water is not available cultivation is the salvation of a crop, but that doesn't

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Cimicifuga—Snake-Root

RICHARD ROTHE

BELONGING to the order *Ranunculaceae*, all the hardy herbaceous species of the genus *Cimicifuga* are more or less conspicuous by a stately ornamentality. For choice effects within moderately moist sections of bog-gardens, as well as for naturalizing along the waterlines of brook, creek and pond, snake-roots are valuable subjects. *Cimicifuga americana*, syn. *Actea*

and produce plants the following Spring. Seedlings cultivated in rich and deeply dug ground will bloom the third year. Plantations fully established as those depicted by our cuts, are of a remarkable longevity, both in semi-shade and the open sun—providing they are not suffering from prolonged periods of drought. As old plants very easily divide, propagation by division is mostly adhered to.



Cimicifuga Racemosa

prodocarpa, abounding amid the Allegheny and Blue Mountain regions, attains a height of from two to three feet. Its large leaves are very handsome, tripinnate in shape, and its white racemes appear during August and September. *Cimicifuga cordifolia*, with white or pale pink racemes in July and August, is easily distinguishable by its large heart-shaped foliage. *Cimicifuga japonica* of a height rarely exceeding three feet, in flower during the later part of Fall up to frost, and its double pinnate leaved form from Kamtschatka, *Cimicifuga simplex*, in bloom during September and October, are producing extraordinary long spikes, those of the last named species gracefully bending over.

Cimicifuga simplex, also listed as *fatida* var. *simplex*, deserves more study and consideration by our advanced amateurs desirous of enjoying variety in foliage and flowers of late Fall displays.

European plantsmen and garden owners unanimously agree on our native species, *Cimicifuga racemosa*, syn. *C. serpentaria*, being the showiest representative of the whole genus. We see it time and again in wooded sections in the light shade of tall-trunked tree-growth throughout our Middle Atlantic States, but rarely in masses. Cultivated in moderately moist section of garden and park in dense, clump-like formation, the effect during July and August is indeed a striking one.

Cimicifuga dahurica, broad leaved, of medium height, is an attractive feature when adorned by white, slender, erect spikes in August. As very closely allied to the snake roots I mention, the False Bugbane, *Trautvetteria palmata*, syn. *Cimicifuga palmata*, with flowers during mid-Summer resembling those of thalictrums.

Seeds of snake roots, sown right after ripening, in light, sandy, peat soil in cold frames will readily sprout



Cimicifuga Simplex

EDUCATING WILD PLANTS

Those who attempt to introduce wild plants into their gardens by means of seeds, often find it difficult to get the plants established in this way. Although they seem to grow well enough in their native haunts, they are slow to germinate in cultivation or fail to come up at all. It is likely that we unconsciously contribute to this failure by treating the seeds differently than they are treated in nature. For instance, we are likely to keep them in a dry room over winter when they are accustomed to lie in the cold and sodden ground through that season. It appears, however, that when wildflowers are introduced into cultivation and propagated by means of their seeds, the slowness to sprout wears off and thereafter they grow readily. A scientific explanation of the facts seems to be that only those seeds which can grow at all in such situations are likely to leave descendants and since children are like their parents, there is soon bred up from these a race of plants that is amenable to garden cultivation by the elimination of those less able to survive in such situations.—*American Botanist*.

Shrubs and Vines for Seaside Homes

ARBORUM AMATOR

(Continued)

ONE of the hardiest and most satisfactory of all flowering shrub is the *Hydrangea paniculata grandiflora*. This shrub, grown either in bush or standard form is suitable for seaside planting. The blooms, which appear in great profusion in July and August when few other shrubs are in flower, are carried well above the foliage in long pyramidal panicles and are white slightly tinged with pink. A unique characteristic of this *Hydrangea* is that its flowers even after they have passed into the seeding period, do not lose their shape or fall away from their stems, but changing from their first color to a light green tint overlaid with red splashes continue to be objects of beauty and, when cut, are in this state, as well as when in fresh bloom, excellent for interior decorations.

Weigelas, known under the botanical name of *Dier-villa*, are suitable for seaside cultivation. Their flowers, which appear in May and June in great numbers, have a range of color from deep crimson-maroon to pure shining white. The June flowering species are *W. Eva Rathke*, deep crimson; *W. rosca*, rosecolor; *W. hortensis nivea*, Snow White; *W. Gustave Mallet*, deep-rose; *W. Lazullei*, dark reddish purple; *W. foliis variegatis*, rose-colored flowers and green and white variegated foliage; *W. candida*, pure glistening white.

The Globe Flower, *Kerria japonica*, a pretty low growing, graceful shrub, gives variety in seashore plantings: its bark as well as its foliage being a pleasing shade of green. There is a variety of this with green and white foliage. The numerous, pretty, yellow, single flowers, reminding one of buttercups, appear in June, and some casual blooms in Summer and Autumn. There is a double flowered variety, *K. japonica flore pleno*, not as desirable, but yet attractive. This shrub is suitable for growing in beds, or as an edging to groups of taller shrubs.

The Groundsel Shrub, *Baccharis halimifolia*, prefers the seashore; indeed is rarely found far from the coast. This has a rounded outline, and though its greenish-white flowers are not particularly pretty, its fluffy white heads of seeds are very attractive.

Other nursery grown deciduous shrubs which may be cultivated with success near the sea are the upright Honeysuckles, *Lonicera*; the several species of the Silver Thorn, *Elcagnus argentea*, *E. umbellata*, *E. parviflora*, *E. latifolia*; the Rugosa rose bushes, whose growth is shrublike; and along the coast somewhat south of New York in sheltered positions, the beautiful varieties of *Hydrangea hortensia*, *H. stellata*, and *H. japonica*.

Native Deciduous Shrubs.

There are a number of native deciduous shrubs, most or all of which may be bought at nurseries, which flourish at the seashore. Among these is the well known Bayberry, *Myrica cerifera*, which loves the sandy soil at or near the seabeach from whose wax taken from the surface of its slate-colored berries our forebears in this country made "bayberry tallow" and "bayberry tallow candles"; Elderberry, *Sambucus canadensis*, whose broad umbels of sweet scented white flowers are succeeded by ornamental shining, black berries, edible but of insipid flavor; Buttonbush, *Cephalanthus occidentalis*, with

round heads of white flowers of a pleasing fragrance, the best of all shrubs, for planting in those low places not unfrequently found just back of a beach, always moist and in which the fresh or brackish water stands most of the time. The Beach Plum, *Prunus maritima*, is the most notable of all seaside shrubs. Growing there in the sand at or just back from the high tide mark, this shrub is perfectly at home; its white flowers are followed by purplish or pinkish edible plums. Arrow wood, *Viburnum dentatum*, whose cymes of white flowers are followed by bluish black berries, and *Cornus paniculata*, a species of Cornel, with white flowers and white berries, grow at the seaside. Here, too, the deciduous Holly, *Ilex verticillata*, well known for its bright red berries in Autumn, will thrive, and also the Fringe Tree, *Chionanthus virginica*, whose fringe-like snow-white flowers are followed by pendulous blue fruit, and last, but not least desirable, the Virginian Willow, *Itea virginica*, which bears sweet-scented white flowers in long erect racemes and which prefers a low, wet location.

Broad-Leaved Evergreen Shrubs

The number of evergreens which can truly be called shrubs suitable for the seaside, is not large. An excellent location for these is at the north or in the northeast or northwest angle of a building, or to the north or in the southwest or southeast angle of the hedge which surrounds the cottage grounds, in which positions they will be protected somewhat from the burning sun and the violence of the winds. In such and similar situations we may plant the native Rhododendrons, *R. maximum* and *R. catawbiense*, and some of the hardier hybrids; also the native Mountain Laurel, *Kalmia latifolia*. With these we may grow the native Sweet Bay, *Magnolia glauca*, a coast-loving shrub with creamy white, sweet scented flowers and crimson fruit. The native American Holly, *Ilex opaca*, too well known to need any description, and the native Winterberry, *Ilex glabra*, whose berries are black, and the *Mahonia aquifolium*, whose yellow flowers are followed by blue berries, will all grow along the seacoast. South of New Jersey in sheltered spots at the seaside we may plant the beautiful *Euonymus japonica* in its many varieties, and all along the coast from New York south, the several species of *Yucca* may be grown satisfactorily.

Narrow-Leaved Evergreens.

The narrow-leaved evergreens are really trees not shrubs, but not a few of these are of such a dwarf, or even prostrate and trailing growth that for practical purposes they are shrubs. In this class of evergreens, which can be planted in sheltered positions in sea-side locations, is the English Juniper, *Juniper communis*, with its many varieties; the Swiss Mountain Pine, *Pinus montana*; the Dwarf Mugho Pine, *Pinus mughus*. Also some of the beautiful retinosporas, namely, *Retinospora filifera pendula* and its varieties, and *R. nana* and its variety *aurea*; some of the Yews, too, such as *Taxus baccata repandens*, *T. baccata adpressa*, *T. baccata aurea*, and *T. canadensis*.

In seaside as well as inland planting, a well arranged selection of both deciduous and broad-leaved evergreen shrubs and of the very dwarf, and prostrate species of evergreen trees precludes the monotonous effect that the use of either alone might produce.

Vines, Trailers and Ramblers.

The climbing species of the fragrant flowered Honey-suckles, *Lonicera*, are grown well at the seashore. They are equally desirable on trellises, and for trailing along fences or over rocks or ledges. Hall's Japan, *Lonicera halliana*, and Chinese Twining, *Lonicera japonica*, are among the best. Both have an almost evergreen foliage, that of the latter being prettily variegated, and both bear sweet-scented flowers, the former several crops each season. We have seen Hall's Japan growing luxuriantly on a rocky bluff directly above the waters of Long Island Sound. The Akebia, *Akebia quinata*, is much more slender than the *Loniceras*, but quite able to resist the shore gales. Its small, purplish, cinnamon-scented flowers are followed by purplish mottled berries, and its five-fingered foliage adds to its attractiveness.

The memorial Rose, *Rose wichuriana*, and its many hybrids are excellent for seaside planting. The Memorial Rose, which bears single white blooms, and whose shining, leathery foliage is almost evergreen, is unsurpassed for trailing over ledges and banks, as is also its variegated-leaved variety. The hybrid Wichurianas, notable among which are *Laxdusa*, double red; *Dorothy Perkins*, both the double pink and double white; *Christine Wright*, double wild-rose pink; *Dr. Van Fleet*, double flesh-pink; *Silver Moon*, semi-double white; *Gardenia*, golden yellow, and the *multiflora* Roses, *Thousand Beauties*, double pink, a practically thornless rose; and *American Pillar*, single rosy-pink, a good hedge rose, are very satisfactory for growing over trellises, fences, pergolas and Summer houses.

Delphiniums: How and Where to Plant

NO hardy herbaceous plant flowering at high Summer-time is held in higher esteem than the Delphinium, none capable of richer effect than it when, rightly regarded, it has been given an opportunity of playing its part. This it may achieve in various ways—in isolated groups, the ordinary herbaceous border, or even in association with shrubs. Afforded flanking positions to Azalea or Rhododendron on rising ground, set belt-fashion in any position where agreeable foil exists, made to rise in succession to Paeony or Pyrethrum informally grouped, or springing from and in its flowering synchronising with waving sheaves of Moon Daisy or like plant, what is there, I ask, among the flowering plants of the year more worthy of considered care, more sumptuous or luminous—if all too rare—than the choicest blues these Delphiniums afford? None, surely! Great in the true sense, they impel admiration because of stature, spire-like elegance and a contribution to garden picture or landscape which is theirs alone. The spacious crescent-formed border on gently rising ground is ideal for them, and whether approached from the higher or lower level at flowering-time, the effect of a well assorted selection just baffles description. As to how to plant them for effect, there is but one way, viz.:

Grouping or Colonizing, and that on as generous a scale as circumstances admit. Most important, however, in this connection is color selection, the Gentian blues here, the sky blues elsewhere, always confining a group to a separate shade or variety. In the case of the *Anchusa*, where the varieties Opal and Dropmore are planted in close proximity, that last named dominating has a belittling effect upon the other. Alone each is capable of brilliant results. So it is with the Delphinium, each color should be alone. Thus arranged each is capable of standing on its own feet, while color clashings and incongruities will be avoided. Then, if one might intrude in a personal sense, it would be to say that the true blues—rich Gentian or sky—having white eyes or centers appeal to me in a stronger way and more immediately than the mixed violet or purplish shades having dark bee-formed centers. Excellent by way of contrast and indescribably beautiful near by, those first named are immeasurably superior in the picture and, because of the double part they play, worthier of fuller consideration. The more graceful their carriage, spire-like their form, with easily disposed flowers, the nearer is perfection, the more generous their decorative aspect. Those having densely symmetrical or columnar spikes cannot hold the proverbial

candle to these in these respects: the colossal and obese fit only for the ranks of the undesirables.

For planting, a word or two in concluding might be added on this head. In light and well drained soils the Delphinium transplants well either in early Autumn or in Spring. For heavier soils, however, I prefer deferring their planting till Spring. Then with renewed growth new root activities follow and the plant soon takes to its new quarters. Every effort should, however, be made to improve heavy soils by trenching, liming, the addition of grit, leaf-mold, burnt clay—most valuable—anything, indeed, calculated to assist drainage and ensure porosity. To this end light litter or long strawy manure is useful. The lighter and sandier soils will be better treated with cow manure because of its cool nature. In general terms the Delphinium enjoys a rich as well as a deep soil, and with the manure worked well down the roots will be attracted to the richer soil in due course. As to the size of the plants, no planter of experience would crave for clumps, and of novelties he is not likely to get them. A safer way, too, even where clumps obtain, is to break them up, *not plant them intact*. A goodly clump intelligently divided would form the nucleus to a decent group, and as crown buds in the Delphinium form readily and freely, periodical division is desirable in order to ensure a continuance of the finest spikes, though in certain soils they may for years acquit themselves well without it. A fair planting piece is that having two or three sturdy shoots and well rooted to boot. A more satisfying plant is that divided a year ago and given nursery treatment since. In large measure the specialists supply these latter only. Finally, in planting, keep the crowns 2 inches or 3 inches below the surface. It ensures the stability of the plant and encourages rooting.

If the Delphinium is to retain its title as queen of the hardy border flowers—and so far it is unrivalled—we must have strong growing plants. However good the color may be, a dwarfed inflorescence is of little use for garden effect; the tallest spires being the best for the border. Delphiniums can be made to bloom for months by cutting off the spikes after flowering. When the center spike is cut away, side shoots send up a succession of flowers. It should not be forgotten, however, that continuous flowering tends to exhaust the plants, and a top-dressing of rich soil and manure should be applied. The clumps should be replanted and divided every three or four years. This is best done in Spring just as the plants

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An Herb Garden

BERTHA BERBERT HAMMOND

“TO own a bit of garden, to scratch it with a hoe, to plant seeds and watch their renewal of life—this is the most common delight of the race, the most satisfactory thing one can do.”—*Warner*.

For those persons who are fortunate enough to have “a bit of ground,” but who, though they have a garden, are too busy to devote much time to the culture of flowers, the making of an herb garden will solve the problem, for herbs are easy to grow, are fragrant, quaintly beautiful throughout the entire growing season, and when partially neglected, produce an abundant crop of useful seeds and foliage.

People who are aware of the many purposes for which herbs are valuable, find it rather difficult to understand how it has come about that a class of plants once so highly prized, and the usual adjunct of every old-fashioned garden, should have passed into obscurity so completely, that even the names of many of the old-time favorites are not familiar to the present generation.

In the olden days no housewife of note would dream of trying to get along without her bed of culinary and medicinal herbs, which were used freely during the season in their green state, and carefully gathered and cured for the flavoring of festive Winter dinners, and for the brewing of aromatic teas and simple home-made soothing syrups.

We frequently hear favorable comments on the French and German modes of cooking. These Europeans are not our superiors in the art of cooking, but with their capacity for taking pains and their appreciation and frequent use of the many different varieties of culinary herbs for flavoring, garnishing, and coloring, they are able to render highly tempting and appetizing dishes which through other methods might have been insipid. In France, where the housewife is famed for her frugality, the ragout or stew is universally served, but the sameness is avoided by the variety in flavoring, and this inexpensive but well-cooked dish makes a savory meal, incidentally exemplifying the sentiment expressed in Proverbs 15:7. “Better a dinner of herbs where love is, than a stalled ox and hatred therewith.”

At present the herbs used by the ordinary American family are parsley, sage, thyme, mint and possibly a few others, such as dill and tarragon for pickling and preserving. However, to most of us, such herbs as balm, borage, angelica and hyssop are merely names. Through poetical references the names of some of the old-fashioned herbs are quite familiar, as

“Lavender whose spikes of azure bloom
Shall be erewhile in arid bundles bound,
To lurk midst her labors of the loom,
And crown her kerchiefs clean with mickle sweet
perfume.” —*Shenstone*.

As we know, lavender was greatly esteemed by the dames of long ago to perfume the chests of home-spun linen and to ward off flies and insects. Rosemary was used at weddings to denote fidelity; it was also considered as an emblem of remembrance. Shakespeare in his writings mentions a number of herbs, and probably knew the sentimental meanings of the period, as “There’s rosemary for you, that’s for remembrance.” (*Ophelia*.)

As soon as the resourceful and ever alert American housewife fully realizes that tasty meals may readily be secured by profiting by this valuable experience of the

cooks of nations famous for their success in the gastronomical art, there will be a demand for a greater number of herbs and consequently there will follow a revival of the so-called old-fashioned herb garden. But aside from an utilitarian point of view, many of the varieties of herbs are interesting and pretty.

The drooping leaves of the tansy are as lace-like as those of the fern, and the fragrant sprays of Sweet Fennel are excellent for use as greenery with cut flowers. The dainty flowers of the coriander add delicacy, and the foliage and flowers of basil, fragrance to a bouquet.

As many of the most desired herbs are perennials, a bed once established requires little care or attention, and will last for years, so that one who has a corner of the garden to spare may with little time and effort enjoy, besides their quaint beauty, the luxury of fresh home-raised herbs, to which the half-wilted, and far from attractive looking bunches frequently seen in the markets, can bear no favorable comparison.

Nearly all the kinds of herbs may be raised from seeds, sown out of doors, but as many of these seeds are small, the chances of having success are greatly increased if in the Spring the little seeds are planted into shallow boxes either indoors or out, and the seedlings transplanted when they are thrifty. Young plants of some of the more common varieties may be obtained from florists, and are, of course, less trouble than raising them from seed. If one already has some plants large enough, new plants may be secured by the making of cuttings or by division of roots. Mint, which delights in a wet location, may be readily rooted in water in a vase or any other receptacle, but as it naturally spreads rapidly there is not the slightest difficulty in having enough of this herb for making mint sauce and for use as a flavor for confection.

Those herbs whose foliage is to be used should be gathered just before the plants come into bloom, preferably in the morning after the dew is gone and before the hot midday sun has decreased the quantity of aromatic oil secreted in the leaves.

With caraway, anise, dill, coriander and other kinds whose seeds are used, the ripe seed heads should be cut on a sunny day, placed on a cloth-covered frame and put where there is a circulation of warm, dry air, until they are dry enough to thrash out. To avoid spoliation neither foliage or seeds should be stirred until thoroughly dry.

DELPHINIUMS

(Continued from page 641)

are starting into growth, though it may be carried out successfully in late Summer, but not in late Autumn. The plants should be cut down about ten days beforehand. They start growth afresh, and are then ready to divide and replant. Do not omit to water overhead and shade after replanting in late Summer.

Every hardy plant catalog contains a lengthy list of varieties. Perfection, pale blue and heliotrope, is very well named. *Rev. E. Lascelles* is purple, blue, with prominent white center. *Duke of Connaught*, *King of Delphiniums*, *Carmen*, *Lamartine*, *Moerheimi* (white), *Persimmon* (sky blue), *The Alake* (royal blue) and the exquisite *Belladonna* (Cambridge blue) are all grand border varieties.—*The Garden*.

Work for the Month in the Garden

SAMUEL GOLDING

NOW that July is here and the rush of Spring planting is over, with the vegetable garden yielding a bounteous and varied supply of crops for the table each day, by no means does it infer that we can now relax our efforts and allow the plants to grow in their own way. The grower will always find ample employment in keeping up plant successions and sowings for some time to come; the quick removal of spent crops, and replanting for Winter supplies without loss of time; and above all the maintenance of a good tilth by frequent cultivation, and giving an abundance of water to maintain the growth of plants during dry spells.

The month of June proved very trying to the grower. The hot sun during the days with cold nights, combined with drying winds, not only retarded the growth of the seedlings and newly planted stock but brought quite a host of evils in its train. It was most conducive to attacks of all kinds of pests, both insect and fungoid, and red spider and aphids have flourished amazingly on many tender subjects, making it imperative to spray and irrigate to save the crops.

Make the last sowing of sweet corn around the middle of the month, using some early variety. Golden Bantam is hard to surpass for planting at this time. Continue to make sowings of string beans, carrots, beets, endive, and also rutabagas. Sow parsley for Winter supplies if possible in a frame where it will winter, to save the transplanting later on.

Keep an eye on the asparagus bed, otherwise much damage will be caused by the larvæ of the asparagus beetle. Spray with arsenate of lead when the plants are damp, or in the early morning when the dew is still on them.

Plant out new strawberry plantations, and give the young plants every encouragement during the growing season. Cut off all surplus runners from the old plants that are intended to fruit another season; trim the plants and fork in some fertilizer.

Spray red currant trees when the fruit has been picked. If they have made a dense growth, remove some of the superfluous wood by judicious thinning so that the remaining wood has ample opportunity to ripen thoroughly. The same treatment applies to the gooseberry. As soon as the raspberries and blackberries have finished fruiting, cut out the old fruiting wood and thin out the young canes to the desired number. Tie up loosely to give them all light and air which helps to ripen the wood properly and aids them to withstand the severe Winters. Keep the growths of blackberries tied during the Summer.

Work in the flower garden at this time would seem mainly to consist of irrigating, staking and spraying for the various pests which attack the plants and trees. But each day brings its work, and if the Fall garden is to be a success there can be no let up in the routine that must be accomplished. Seed pods must be picked off continuous blooming plants such as the Gaillardias, Pyrethrums, and it is good practice to keep seed pods picked from all plants as they tend to waste the strength of the parent plant to no purpose, and all its reserve strength should be conserved to build up its constitution for the next blooming period.

Dahlias are growing apace, and should be well supplied with moisture. Watch closely for red spider and aphids, and spray with Aphine; keep the growths tied frequently, otherwise they may suffer severely during heavy storms.

There is still time to sow such annuals as candytuft, *Phlox drummondii* or other quick maturing plants for late cut flowers. *Nemesia strumosa* is a very useful plant to grow, if sown during this month and flowered in a cold frame during the Fall, and it will continue to bloom over a long period. Pansies, *Myosotis*, and double daisies can be sown for bedding next Spring. Transplant the biennials when large enough to handle. Allow Canterbury Bells and foxgloves plenty of room to develop so that they can be lifted with a good ball in the Fall.

As soon as the rambler roses pass out of bloom cut out much of the old wood, and all old flower stems; tie up the new growths and allow enough space for development; remove weak and useless shoots as they tend to retard and sap the vigor of those left to furnish next year's flowering wood. Some varieties are very susceptible to mildew, of which the old Crimson Rambler is notably so. If this makes its appearance, spray with Fungine or Melrosine. Shorten back the growths of Tea and Hybrid Teas and give them a dressing of sheep or blood manure. Go over them with the cultivator and water the fertilizer in well. They should have generous treatment to insure good blooms toward the Fall. Spray them occasionally to prevent mildew.

The past few weeks have been very trying for newly planted trees and shrubs. Continue to give them an abundance of water at the roots, and a spraying from the hose will be beneficial. Should the weather be dry this helps them to recuperate after hot sunny days.

Plantations of azaleas and rhododendrons must not be allowed to suffer from drought. These and evergreen hedges can be sprayed with Plant Oil to prevent or destroy red spider which is a deadly enemy if allowed to gain a foothold and make a headway.

Shear privet and barberry hedges as they need it. When these are well kept and tidy they add much to the general appearance of the garden.

Trained fruit trees and dwarfs will now need care. The stopping or pinching is generally referred to as Summer pruning. This operation consists of pinching the growths back to five or six leaves according to the vigor of the variety, but judgment must be exercised when doing this. If done too soon, it may have the result that most of the remaining buds will push into active growth, thereby defeating the end which Summer pruning aims to attain. And, moreover, it can be deferred too long. If the tree has made a thick or luxuriant growth the sudden exposure of the fruit to the strong sun may result in a serious check to its growth, but when done when the leaves are all fully developed, it does much to help ripen the wood and form good fruit buds. If left undone the long shoots appropriate the sap to no good purpose. When these trees are most vigorous, making strong growths and producing no fruit, it is possible that if in the Fall they are root pruned, this will be the proper remedy. It checks overgrowth and increases the fruitfulness of the trees.

The Greenhouse, Month to Month

W. R. FOWKES

JULY is the hottest month of the year, and irrigation plays an important part in plant culture. Carnation planting is in progress with field grown stock. Dry weather has caused small plants which, being well ripened, will soon thrive indoors. Stem rot will show itself this season if careful cultivation is not adhered to. Fungicides must be used. Do not forget to spray with Aphine every week to kill red spider.

The mums require much water. The disbudding of the large kinds should be attended to, and one should take care to retain the proper shoots. Begin to feed with bone meal and soot water.

There are many fine blooming plants that will give pleasure in the greenhouse this Winter. At the end of July, sow Clarkias; the seedsmen catalog the suitable kinds. Sow in light soil in as cool an atmosphere as possible, and when they appear, transplant into flats, and then later pot them. Cool treatment is enjoyed by these plants.

Wallflower, *Kervensis*, is another useful Winter bloomer, and the same treatment which we give to Clarkias will suffice.

Schizanthus Excelsior should be sown in the same atmosphere. One can cover a good-sized space from a few packets of seed at small cost.

Mignonette is ideal for pot culture. It is grown so successfully in the benches that pot culture is seldom resorted to, but a few dozen pots well grown are a delight. Sow seeds of a good variety in two and a half-inch pots in full light, and when the seedlings are one inch high, thin out and leave two plants. When nicely rooted, prepare a rich sandy compost and repot into five-inch pots. Place some good old cow manure on top of the crocks, which have been placed in the bottom of the pots, and fill in with compost. Grow along steadily. The main thing is to avoid damage to the tap root, so stand on bricks in order not to tempt the tap root out. Pinch growing shoots twice and they will be a useful addition to the list of pot plants.

Sow some *Gloxinia* seed. Corms were scarce this year and in order to have your greenhouse attractive a year hence, prepare now. Use light sandy soil and a well-drained flat or pan, which should be watered with a fine rosed can two hours before sowing. Do not cover the seed with soil, but place a piece of glass over, and shade. Watch the arrival of the seedlings, and as soon as they can be handled nicely, transplant them into two-inch pots carefully. This is an unwelcome task to many people, but after they have been transplanted they can be grown along until they are fair-sized corms and then rested until next Spring.

One should sow a little pansy seed in a cold frame, and they can be transplanted into pots and be useful in the cool house. *Polyanthus* also can be sown and *Myosotis*, which will please the eye with their beauty during next Winter and be a change from the regular stand-bys.

Cyclamen should be in four-inch pots and be given their final six-inch pots early in August. These cool-loving plants delight in a compost containing a little French or Scotch soot and cool treatment. They must be carefully sprayed and the fine colored foliage is a

pleasure to behold. We are growing Joseph Manda's hybrids, which are a vast improvement over other existing kinds.

Begonia Chatelaine is a useful dwarf pot plant. Half a dozen plants divided up will make a goodly number. They will thrive under conditions that would be fatal to the Lorraine types.

Do not neglect the young Gardenias which were propagated in Spring. In the Summer hurry, one should not forget to add some peat to the compost and keep them clean. If one has good stock in six-inch pots, he will have a splendid array of bloom next February. They should not be grown more than two years in pots. The finest I have ever seen were raised at the Gardens, Morsmere, Yonkers, by Hamilton Scott, who is an authority on cape blooming plants.

Young rose plants that were put in the benches six weeks ago, should be carefully cultivated each week by hand. Do not use any other cultivator. Keep clear of weeds which harbor spider. Watch that they are never dry at the roots; try and encourage firm growth by not spraying too often. Pinch all buds off as soon as they are strong. Sprinkle lime under the benches and do not allow aphids to puncture them.

If freesias are desired for the end of December, they should be potted by the tenth of August and placed in a cold frame with boards over the pots to keep the sun from drying them out. They must not be covered with ashes or sand like hyacinths, for they are too fragile.

Procure some Bermuda buttercups, which will make the most glorious straw yellow basket plants one can possess in the Winter. Plant the small bulbs in little pots and then when well established transplant into the baskets.

Pot mums of the bush kind should be pinched occasionally and, if wanted for October, should have the last pinch by the twentieth of August. Give plenty of water, stake, and keep clean.

This is the growing period for orchids, which calls for plenty of water. However, one should be careful not to soak the plants too heavily. It is a wise plan to syringe over head during the evening of a hot day, which will help to maintain their growing in a natural way, as the dews at night in their native habitat are so beneficial.

Be on a sharp lookout for snails. A few toads in the greenhouse are of great assistance in this line. The destruction caused by these pests to growing shoots and floral spikes would be alarming if not checked. Many cases where orchids have not bloomed can be traced to pests. *Cattleya Gigas* which has just blossomed, and may need repotting, should be attended to. Do not use moss for this variety; peat, well firmed, and as light a position as possible without scorching.

The man who thinks he has done everything he can do, has merely stopped thinking. He is what might be called "up and out," and excepting that he has more money his case is not really very different from that of the man who is "down and out."—*American Magazine*.

July Birds

PAUL B. RIIS

THE nesting season now has advanced to a point where many of the two brooded birds are engaged in raising their second brood and the cares of the household will lay heavy on them for yet awhile. Robins and bluebirds are nearing the point where the young will shift for themselves. Downy and hairy woodpeckers, nuthatches and chickadees have completed their only brood sometime ago, while some flickers and redheaded woodpeckers are still feeding their young. However, both of these birds nurse their nestlings a longer period. Meadowlark, brown thrasher, towhee, woodthrush, rose-breasted grosbeak, phoebe, catbird, house wren and many of the sparrowy birds are all in the incubating or nursing stage of their second nest. Song is slightly waning and will decrease gradually until most birds are again silent, excepting for their call notes.

It is indeed a wise provision of Nature that the season of nesting and the season of growth of vegetation are simultaneous. The nestlings, often consuming their own weight daily in granivorous or insectivorous feed, mostly the latter, would find their daily rations curtailed at a later period of the season. The tender shoots of all vegetation in early Spring and Summer are especially favorable to the rapid increase of insects. The time is propitious to study the economic value of our birds, by reason of their diet.

The sparrowy birds usually divide their field of activity at this season, eating some seeds and many insects with an increasing diet of seeds as insects are becoming less abundant, many of them subsisting largely on weed seeds and waste grain during late Fall, Winter and early Spring. The bronzed grackle, a great destroyer of grub and beetle, is gradually changing into a scavenger of refuse heaps as is also the handsome redheaded woodpecker. The meadowlark feeds much upon insects, grub or larvæ, resorting to seeds and waste grain in their season. The robin appears to disdain a vegetable diet altogether, excepting for cherries, strawberries or wild fruits. Bluebirds are almost entirely insectivorous and show much energy among the potato beetles. Flickers are particularly useful in destroying ants and many a lawn owes its unbroken, velvety sward to the peculiar ant-eating habit of this woodpecker. The house-wren, the most indispensable ally about the yard, devours great quantities of insects in every form and on account of its small size, covers a field not trespassed on or worked by any other bird. The catbird, a lover of fruit though he be, should be permitted to select the food which through its qualities of virtue, assures us of his great repertory, unsurpassed by any of our aerial artists. And many are the insects eaten by preference, which makes this species distinctly a beneficial one. The purple martins, swallows and chimney swifts, the phoebe, wood pewee, kingbird, in fact all of the "flycatchers" are doing mankind an inestimable service by eating mosquitoes and flies in great numbers. Purple martin, phoebe and barn swallow can be attracted to the yard and make ideal tenants, the latter two preferring a little more open country. The kingbird, too, known scientifically as *Tyrannus tyrannus*, is true to his name and attacks without the least hesitation a pilfering blue jay, crow or hawk, although some would have us believe that his daring is all bluff. And yet we have encountered no bird so far which will show as much genuine concern and fine anger for its young in the face of danger or make a more dashing and

brilliant attack than a pair of blue jays which find their secret discovered.

The nighthawks, too, soaring high on strong wing, subsist entirely on insects, which are mostly injurious. Thus the list can be continued until every species has been enumerated.

It is passing strange that birds themselves contribute so largely to failures of the egg or nestlings, but personal notes place the loss of entire nests through eggs sucked or disturbed by other birds at 20 per cent of the total of unsuccessful nests. Among these disturbers or egg thieves are counted several of our more aristocratic birds, which sometimes ply their unsavory trade through necessity. These birds escape the general persecution by our desirable feathered friends and can be termed "casual enemies." But it is not the purpose of the author to betray the identity of these since the motive may be misunderstood and not accepted as scientific facts. The golden days of June are all too often converted into overabundant showers, accompanied by aspiring storms. We have learned of but a few nests which were entirely successful and wonder how Nature is going to proceed to strike the proper balance. One in touch with Nature is dismayed with the many unseen forces at work to destroy bird life, with but few happy conclusions to brighten the outlook or a fortunate break in favor of the birds. And the small boy certainly is not of the least to be reckoned with and many times, we of mature judgment, bungle inexcusably, and contribute a share to the annual loss.

WATER AND CULTIVATION

(Continued from page 638)

alter the fact that water properly applied will not merely save a crop, but make it 50 per cent or 100 per cent better. This writer has done his share of cultivating and watering and knows one is no use without the other, at least, the maximum benefit is not obtained unless the two go together.

It may be a fact that our seasons are changing; certain it is that if we have a dry Spring our crops either the same year or the next are not up to the mark.

It may be taken for a fact that fruit trees require enormous quantities of water during the Spring when they are making leaves and developing buds for the following year. Lack of moisture in April and May means starved buds for the following season. No amount of watering or rain later will make up for the shortage at the critical time.

Much the same may be said of ordinary garden stock. Newly sown or newly set out plants cannot make headway if drought persists. Early starvation, due to lack of moisture, means weakness all through the season. It is utterly useless to apply nitrate of soda or any other dry fertilizer unless water follows immediately. Such fertilizers simply remain undissolved, and, as the plant roots cannot and will not take hold of such fertilizers as they do the humus from decayed yard manure, the application of fertilizers is wasteful, inasmuch as the more soluble parts will, later on, be washed away without benefiting anything.

Just remember that plants are largely water, and if desired at their maximum they must never go short of it. —*Florists' Exchange.*

How Does Your Garden Club Grow?

OLIVE HYDE FOSTER

THAT neighborhood you live in and know so well, did you ever stroll through it with your eyes really open, looking around you critically as though you had never seen the place before? That was what Mrs. John W. Paris, of Flushing, Long Island, found herself doing one Spring day six years ago. What was her dismay to discover that the only sign that her neighbors were making any effort to beautify their door-yards was an occasional round flower-bed filled with red geraniums. Then and there the idea of the Park Garden Club was born, and it was not long before it had an interested membership of thirty.

The first meetings of the club (held twice a month) were on Monday mornings, in the different gardens, to study the various problems, compare notes and discuss methods of growing better flowers. By Autumn women in other sections were begging to be admitted, and the original number decided to keep up the good work throughout the year and move indoors. The membership limit was raised and the meetings changed to the afternoons, to be followed by a cup of tea for sociability. But even that first Summer there was a small flower show held in the public library building.

Soon the war came on. The club raised special funds through its entertainments, for the Red Cross, the Y. M. C. A. and undertook the support (which it still maintains) of two French orphans. It bought, as well as sold, thousands of dollars worth of Liberty Bonds, started the movement that led in that community to the establishment of thousands of war gardens, arranged, through the State College of Agriculture, for a free course in vegetable growing, and then opened for the Summer a public canning-kitchen. The women taking the course subsequently acted as instructors throughout the season, although many of them previously had not done even their own housework!

The club also bought fruit-trees for devastated France, kits of tools for the French peasants, and instituted a three-day community fair (Thursday a flower show, Friday a vegetable show and Saturday a baby—or human flower—show!) which netted approximately \$5,000 for the town hospital. It planted what is said to be the first live Christmas tree, it established a bird sanctuary and feeding-station, and maintained public interest in food production and food conservation by several seasons of war-garden exhibits, with stimulating prizes. And up to last Midsummer (in six seasons), it had given no less than thirteen flower shows and special exhibitions.

With the close of the war the club succeeded in getting, through the park department, enough memorial trees for each of the public school grounds in the town, and also co-operation in the planting in the park of a memorial knoll for the local heroes. To this latter it contributed (from club funds) two white oaks, chosen for strength and longevity, to be dedicated in commemoration of Theodore Roosevelt and his gallant son, Quentin. Also in this park it has planned, with the aid of the officials, to establish for both beauty and study, a bit of wild garden along a little stream, with the plants native to Long Island. And it has carried on a vigorous campaign to protect the native plants and wild flowers, especially those most injured by motorists—the laurel and dogwood, now threatened with extinction. But its main object at the present time, aside from stimulating interest in more general tree-planting, is the arousing of interest in gardens and co-operation in the organization of other garden clubs.

And this brings up the subject of the club's management and methods. Its simple constitution and by-laws, as set forth in less than three hundred words, remained practically unchanged until this Spring when it was found advisable to raise the dues—active from \$2 per year to \$4 and associate from \$3 per year to \$6. And whereas formerly both business matters and a program usually occupied each meeting, the first meeting of each month is now devoted almost entirely to business.

With these twelve business meetings so arranged, the second meetings are left for the special programs. Influential people prominent in music, art and literary circles have given talks which have contributed to the brilliancy of the club's success.

Authorities have responded eagerly to invitations for addresses on their particular subjects, the culture of such special flowers as the iris, the peony, the rose, and the preparation of the soil. Landscape gardeners, writers, editors, artists, have talked to the club. Even within the club are certain women who have been so very successful that they are regularly called upon to report on their experiences and accomplishments.

In the beginning, the programs together with the constitution and by-laws were published in an attractive little year book. But during the strenuous days of the war people could not make plans so far ahead, and so finally the idea was developed of a quarterly magazine, *The Garden Bulletin*, which carries current club news, gossip of other garden clubs, and full reports of the addresses.

The club has also a tree committee, to look after local tree interests, and a motor committee to arrange for field day and flower show transportation. It also decided last Spring to start special flower committees and announced roses, peony, iris, dahlia and perennial departments, one of which each member was asked to join for special study. This has proved surprisingly successful, and at the height of its season, the rose, the peony and the iris branch has each given a fine special exhibition, with a tulip show of wonderful beauty for good measure. The club exhibited at the Dahlia Society's show in New York, and held a chrysanthemum exhibit in November.

Moreover, the cultivation of the humble vegetable still goes on; and at the previous annual Spring and Autumn exhibitions, there has always been a fruit and vegetable section, with special prizes for the children.

The field days of the club have proved a source of inspiration as well as pleasure. Once a year at least it plans a trip to some point of interest to garden enthusiasts.

All these club activities, however, mean something more than social intercourse, than bigger beets and finer dahlias. The first material consideration that they bring is health.

But most important of all, the garden counts for saner, more beautiful living.

Sensing this, the club printed in one of its earliest year books, the lines of Thomas Edward Brown:

*"A garden is a lovable thing, God wot!
Rose plot,
Fringed pool,
Fern'd grot—
The veriest school
Of peace; and yet the fool
Contented that God is not—
Not God! In gardens! When the eye is cool?
Nay, but I have a sign;
'Tis very sure God walks in mine."*

—McCall's Magazine.

A Lesson on Soil Improvement

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

A SOIL may be naturally very bad or very good, with all the intermediate stages from one extreme to another, for many reasons, but the worst soil will undoubtedly respond to intelligent efforts for its improvements while the best soil will as surely fail to produce the best results if it is neglected or wrongly treated.

The first point to be considered is that of drainage. If a soil is not naturally well drained, then some means must be taken to drain it artificially, otherwise all other work in connection with it is more or less ineffective. Good drainage is essential in order to regulate the water supply. An excess of water in the soil is equally, or more, injurious than a scant amount. If the water which falls upon the land is allowed to flow over the surface and can not enter the soil there is not sufficient reserve water for crop growth. After the soil has absorbed all the water it can, drainage is necessary in order that the surplus of unabsorbed water may escape, because stagnant water around plant roots (leaving out of consideration those of a more or less aquatic nature) is poisonous to plant-life. Good drainage stores more water in the soil in an absorbed—not free—condition and prevents mere surface accumulation and loss. Good drainage is assisted by deep and thorough cultivation; this has to be accompanied by tile drainage if the subsoil is not sufficiently porous to allow the unabsorbed water to escape.

Well-drained land is warmer in the Spring, has a larger reserve store of water, therefore withstanding drought better, and is altogether in a better condition for crop growth. Many swampy lands are highly productive when properly drained, and in any case a high state of productiveness is impossible without suitable provision for drainage.

When the pores of the soil are filled with water, air is excluded and the necessary chemical and bacteriological changes which result in rendering plant-food available, fail to take place. Many of the bacterial diseases to which crops are subject are caused primarily by a diseased condition of the soil. These diseases can often be checked by securing good drainage. Undrained soils are unsanitary; the harmful products of decay of the organic matter accumulate in the soil and produce toxic or poisonous compounds which affect crops. When soils are drained, air is admitted which prevents the formation of these products.

To improve the physical character of extreme soil conditions, whether of the lightest sand or of the heaviest clay, the same methods are, in several directions, applicable. The terms "heavy" or "light" as generally applied to soils indicate ease or otherwise in cultivating rather than their actual weight, as a cubic foot of clay soil weighs approximately thirty pounds less than one of fine sand.

After drainage has been attended to when required, liming is usually the next step in soil improvement. The action of lime is physical, chemical and biological, and is more valuable in these indirect ways than as actual plant-food.

The mechanical action of lime in improving the physical character of a soil may be looked upon as of great importance, and in a general way lime makes heavy soils lighter and light soils heavier. On clay soils the adhesive property and tendency to puddle is lessened by the application of lime; such a soil being thereby made more friable when dry, since lime, unlike clay, does not shrink in the process of drying and therefore the mixture dries off in smaller particles instead of contracting into the familiar hard lumps. In order to understand more clearly this action of lime upon clay soil it will be well to examine into the cause of the well-known adhesive and plastic properties of clay.

The difference between a heavy and a light soil—using the comparison in its popular sense—as shown by mechanical analysis, is that the former contains a preponderance of very fine particles, some of them so minute as to assume a gelatinous nature when separated from the coarser particles; whereas the latter contains a preponderance of large particles, the lime above mentioned gelatinous substances being practically absent.

When lime is added to a clay soil it collects together these fine, or "colloid" substances as they are technically termed, forming them into loosely-bound particles; that is to say, it coagulates the finer particles into coarser grains, and automatically frees the larger particles from the adhesive action of the colloids. This action is known as flocculation. A simple illustration of it is

easily afforded by the addition of a little lime to a glass vessel containing muddy water from a clay soil. It will be seen that the lime immediately flocculates the fine particles held in solution and precipitates them to the bottom of the vessel, leaving a clear fluid. The practical result of this flocculation of the fine particles of the clay is to give the effect of a coarser-grained soil. Under these circumstances not only is the soil more friable when dry, but it is also less retentive of moisture when wet; it therefore becomes permanently drier and warmer, permitting of earlier cultivation in the Spring, which is a matter of the utmost importance with heavy soils. The disintegrating effect of lime upon clay soils is also due to the chemical change of the oxide of calcium (CaO) to the carbonate (CaCO_2).

Upon light, sandy soils lime acts as a binding agent and enables such soils to obtain more moisture from the subsoil by capillary attraction, at the same time increasing their retentive powers—in short, making a sandy soil more like a sponge and less like a sieve. This increase of retentive power also increases their ability to hold plant-food.

Lime also improves the crop-producing capacity of soils by its chemical action. Lime is a powerful alkali, and as such combines with and neutralizes any acid with which it may come into contact. Acids are continually being formed in the soil by the decay of organic matter in the form of plant-residues and cover-crops turned under; they are also produced after the application of stable or other organic manures. Other and stronger acids are introduced into the soil by such fertilizers as acid phosphate and sulphate of ammonia.

Lime has a further and more complicated action in rendering the three chief ingredients of plant-food in the soil (nitrogen, phosphates and potash), available for plant nutrition, and retaining them in this form. Its work in connection with phosphates and potash is practically purely chemical, but as regards nitrogen it is almost entirely biological, inasmuch as nitrogen is only brought into an available condition by being changed by bacteria into nitrate, these bacteria cannot carry on their work in an acid soil nor complete it in a soil which does not contain lime in a free state. As we have previously in these columns gone somewhat fully into the various reactions which are chemically brought about by lime, and also shown the several ways in which lime acts biologically in connection with the various species of the population inhabiting the soil both as to its good effects in connection with beneficial bacteria, and its good work in checking or preventing the growth of those other micro-organisms which are harmful to the soil and to higher forms of plant-life, it does not appear necessary to do more now than merely restate that lime has a great many attributes of usefulness in soil improvement.

As there are several forms in which lime may be used it appears worth while to briefly consider them.

Lime exists in Nature as calcium carbonate (CaCO_2), forming whole mountain chains of limestone, chalk, marble, etc., and comprising approximately one-sixth of the earth's crust. The preparation of lime consists in the first place of burning the natural stone in a kiln; as the result of this process carbonic acid gas is driven off and caustic, quick, or oxide of lime (CaO) is produced. This is put on the market just as it comes from the kiln, as well as after being ground. Another form which is now used perhaps more than any other for soil improvement is calcium hydrate or slaked lime (Ca(OH)_2), the slaking bringing it into the finest possible state of subdivision. Of late years lime has been much used in its natural state of calcium carbonate by grinding up the rock and sold under the name of ground limestone. A distinct form of lime unconnected geologically with limestone rock is calcium sulphate (CaSO_4), otherwise known as gypsum or land plaster, this being found in various parts of the world in more or less thick deposits.

While, so far as improving a soil by increasing its lime content is concerned, any of the above forms of lime may be used, there are various special connections which render one form more suitable and desirable than others.

Quicklime is the most active form, but it should only be used upon heavy clay, swampy, or muck soils. Its oxidizing action upon the humus content of soils is so rapid that it is liable to do harm upon those which do not contain humus to excess. The

(Continued on page 651.)

Departments of Foreign Exchange and Book Reviews

WOMAN IN HORTICULTURE

IN our age, when the participation of woman in work relating to horticulture is more than ever the order of the day, and at the precise moment when our National School of Horticulture at Versailles offers to the feminine element the first real means for engaging in this life, it will perhaps be not without interest to consider the ideas that our neighbors and friends across the Channel may have on this subject, those among whom the emancipation of woman has lately made so great progress.

We find just now, in the March number of the *Journal of the Ministry of Agriculture*, a very interesting article by Mrs. Kate Barratt, in which, under the title, "Women in Horticulture. Their Future Possibilities," she sets forth her ideas and predictions having to do with the conditions, actual and future, of women engaged in our occupation in England.

Although French horticulture may be in general in a condition less favorable than English horticulture, and because for this reason it cannot offer to our women the same chances of success that are permitted their English sisters, it remains established nevertheless that these last seem to have gained in their country an important place in the different branches of trade.

Their example will have, then, some advantage in being followed by the feminine element of our country, desirous of finding in horticulture a future situation in accord with their tastes.

The article by Mrs. Barratt may, then, be of some interest to all who, near or far, follow the development of this important question. In order to preserve for this exposition the special character which has been given it by its author we give below a translation of the original as faithful as possible.

For about a score and a half of years English women have progressively addressed themselves to horticulture to the end of finding a stable occupation and of assuring themselves at the same time of the means of existence. The first who engaged in this life had to face all sorts of prejudices and their lot was not always very enviable; nevertheless, their number increased so rapidly that soon they were met more and more frequently and in occupations more and more important. The majority among them found employment upon private estates, whether as chief gardeners or simply as assistants; others, in the suburbs of London everywhere, specialized, with success, in the management of gardens; others, in fine, were found in floricultural establishments or in nurseries, as well as in kitchen garden establishments and in truck raising, some as proprietors, others as employees.

Among those who had been drawn toward horticulture by an innate taste for this profession, or by desire for life in the open air, several often were attracted by the scientific side of their work; and, after having completed the appropriate studies, they were not long in finding employment in the teaching corps of the different schools and colleges. Beyond the advantage of work more attractive, these women profited through a remuneration more advantageous than in the case of employment merely manual.

Then, consequent upon the war, and when men had responded to the call to arms, the women having practical knowledge sufficient found a vast field for action open before them. One of the sudden results of the utilization and importance of the feminine element in horticulture was a rapid dissemination of capable workers, relatively few in number, among a large number of newcomers possessing only rudimentary acquaintance with work. It may be believed that this invasion of the profession by workers without much ability has an unfavorable influence upon the future possibilities of women in this life since the war. Very many among them in our days endure with difficulty competition with men. The rising of the cost of living also has made its effect felt upon horticulture; in consequence of the repeated augmentation of salaries and in consequence of the shortening of the day's work, very many gardens have proceeded to a noticeable reduction of their staff, especially of the feminine staff, which, in certain cases, has been entirely disbanded. The men are, in fact, more fitted for hard labor, and this is the one consideration in the evaluation of their respective merits.

The war has been the cause of a sudden complete change also among the traditions of many private estates; while at other times the question of pure ornamentation was the most important, although many of these estates are in a condition of perfect maintenance, the predominant interest tends toward the caring

for fruit gardens and vegetable gardens, because of the revenues of which they are the source. On the other hand, truck gardening has taken on, in these recent years, a great extension, in consequence of the general increase in the price of commodities consumed, and it has become a branch of occupation much more important than in other times, although the selling price of greens has now mounted scarcely to cover the cost of cultivation.

These two factors have affected directly the employment of female labor; in short, there, where the pecuniary revenue is the sole aim in view, the quantity of work furnished, although it ought to maintain a certain degree of quality, represents the most important point in the production; and it is just the physical disadvantage of woman that prevents her from being able to meet the competition of man.

The consideration of all these points involves the necessity for woman to devote herself exclusively to branches of horticulture for which she is better formed. She will have to direct herself toward occupations in which the lack of physical strength is of the least importance, and in which she will have opportunity to measure in value the special aptitudes inherent in her sex. She will always have to be ready to render compensation for limitation of work by the advantage of quality. Certain horticultural labors will suit her perfectly; for example, the propagation of plants, packing, the work of sowing and transplanting, the working with frames and hothouses, the culture of flowers and bulbs, etc. * * * The remuneration accorded to manual laborers being as yet raised only a little and not representing, in the majority of cases, more than a sum just necessary for existence, it will then be necessary for her, to render her life sufficiently attractive, to find a compensation in the satisfaction yielded by an occupation in the open air and with agreeable esthetic sensibilities.—Translated from *Revue Horticole*.

THE RAISING OF SEEDLINGS

IF the art and right practices of germinating seeds were universally understood, a bad time for the seedsmen would be the consequence. Nevertheless, there is no reason why every garden owner should not learn to be successful at it. The compost should consist of equal parts of old turfy loam, old leaf mold, and quartz sand, well mixed together, and be the right degree of moisture, neither too dry, nor too wet, just moist. The drainage must be, above all, thorough, and for this reason the quartz sand should be a mixture of the three grades, fine, medium and coarse, proportioned to suit the seed to be germinated. This compost will do, with the addition of 2 ozs. of steamed bone flour per cubic yard of soil for pricking out the seedlings into boxes, and with the addition of lime (purest grade) and potash for potting up into thumb pots, 1½ oz. of lime and ¼ oz. of sulphate of potash per cubic yard being the most suitable quantities. Seedlings which hate lime should have wood ashes instead of the lime and potash, say 6 ozs.

Procure clean 7-in. pots and in each one invert a thumb pot. Fill in with crocks; over the crocks place a thin layer of dead grass roots (not dead grass leaves), then fill up with compost and firm the soil evenly, but not too hard. The seed should be sown as thick as Mustard and Cress (I can hear murmurings of dissent all around), lightly covered with fine compost and pressed firm and quite hard. The top of the soil should be nearly level, except a very slight rise in the center. If ordinary sized seeds are sown, water with rain water (freshly fallen rain for preference), through a fine rosed can until the drainage runs. In the case of very fine seeds, dip the pots in water to two-thirds their depth and let the water rise through the pot till the surface soil is wetted. Drain (being very careful to handle the pot gently), cover with a sheet of glass, over which place sheets of brown paper. The giving of more water as and when germination is proceeding should be with the greatest care and judgment, if damping off disease is to be avoided. Examine every morning and evening in order to give some air, and only give more water through a fine spray pump when the surface is actually dry. As soon as the seedlings show leaves, give some air by covering only two-thirds of the pots with the glass and remove the brown paper altogether.

Prick out the seedlings into shallow (2-inch deep) boxes as soon as they can be handled, about 1 inch to 1½ inches apart. In these boxes they will make especially fine roots on account of the steamed bone flour, which has an extraordinary vigorous action on seedlings.

Finally, either pot up into thumb pots or plant out into their permanent quarters. In the latter case they will establish themselves better and give superior final results than imported adult plants. Needless to add, each seedling should be lifted with a ball of earth attached to the roots. As the plants grow on, about the grand period of growth, a weak application of nitrate, say one-eighth ounce nitrate of soda to the gallon of water administered twice, at an interval of ten days, will still further enhance the results.—*The Garden.*

STAKING HARDY PLANTS

THE beauty of borders filled with hardy plants is often marred through bad staking or choice of the wrong material. On many occasions I have deplored the unlimited use of Bamboo canes, which all too often spoil the graceful and varied growth of hardy plants. For certain plants, such as Lilies, Camassia, Hollyhock, some of the Michaelmas Daisies, and certain stiff-stemmed plants, Bamboo canes may be used to advantage, but even here it is most desirable that the stake should be tied close to the growth it is intended to support.

I have not yet found anything so desirable as sprays of Hazel, both for effective support and natural effect. These, in their various lengths, may be prepared during bad days and tied into bundles for use as required. They should be so arranged as not to destroy the natural disposition of the subject concerned, be it large or small. Where taller plants require support from the commencement of growth short stakes should be used at first, taller ones being added as the plants advance. A plant should not be allowed to squat, yet this often occurs, especially among old-established groups. When it does, effective staking becomes impossible. Anchusas are very liable to do this, also Oriental Poppies, Larkspurs, etc., but if caught in time and Hazel boughs applied intelligently these will, by the time the flowering period is reached, be obscured by foliage and the natural growth of the subject preserved. When staking, it is always advisable to insert one or two in the center of large plants to prevent swaying by rough winds, afterwards supporting the outside growths with the least possible number necessary to obtain the desired object.

This method of supporting hardy plants will be found far more attractive than the common practice of placing around the plants a ring of Bamboo canes connected by lines of string.

For Carnations and similar plants I much prefer these twigs, for not only is the effect better, but the gathering of the flowers may be done more speedily than is the case where each flowering shoot is tied with matting to a cane. In the case of larger herbaceous plants a careful staker will intersperse his supports between and among his plants to such good effect that, with the exception of the tips necessary for the advancing growths, these are practically hidden from the first. One great error in the growing of hardy plants is crowding, and, where this is so, many plants lose their lower foliage early in the Summer and are then troublesome to deal with, and rarely are effective. Frequently a dozen plants are seen where three should be, all true form being lost and the plants deprived of the sun and air necessary for their future development. There is no reason why a skillfully planted and judiciously staked border of hardy plants should not show the natural grace and form of every plant it contains, whether used individually or in groups.—*Gardening Illustrated.*

MORaine GARDENING

THAT the moraine has solved the question of how to succeed with most of the difficult alpine plants is a well-established fact by now, but I have reason for believing that the very elaborate instructions advocated by several enthusiasts, who recommend concrete basins, water inlet and water outlet valves at various levels, in addition to very elaborate mixtures of granite or limestone chips, have frightened many lovers of alpine plants from facing an expensive looking adjunct of this kind.

I have for many years experimented with moraines, and have had perhaps my greatest success with the simplest arrangements. I hold that, when obtainable, quarter-inch limestone chips are ideal for nine-tenths of the plants grown in the moraine, most of the plants that avoid limestone formations in the wild state putting up with it quite well in gardens. Only here and there does a lover of granite decline to settle down in lime chips. Pronounced peat lovers, mostly woodland or Heath dwellers, no right-minded gardener would condemn to this treatment, of course. Failing limestone chips, I have used gravel washed clean with one-quarter its bulk of finely sifted leaf-mold added. Slate chips and leaf-mold, granite chips and leaf-mold, and even old flower-pots ground through a crusher to quarter-inch size and less, and mixed in the same proportion I have also used with success. The conclusion I have come to is that the chemical composition does not matter so long as the physical condition is right. Provide a thoroughly porous, well-drained material

that absorbs and lets water through readily and never cakes on the surface, and you have the main essentials for success with the rarer alpine plants. If there be a slope facing southwest in the rock garden that could be utilized for a moraine, dig it out two feet deep, lay in six inches of rough drainage, over this a layer of grass or peat turves, grass side down, and fill up the remaining eighteen inches with one or other of the mixtures I have recommended.

Keep the surface on a good slope, and if the moraine is large embed in it stepping-stones here and there to enable one to attend to one plant without standing upon another. If there is no rock garden and one wishes to grow a few of the rarer alpine plants, take out a hole upon the lawn, say eighteen inches deep and as large as you think fit. Put in the drainage as before, then turves, then the porous mixture nearly level with the surface of the lawn, make this firm, and set up an edging of rough stones all around upon the mixture and fill in the resulting well with more chippings, make it slightly highest in the middle and bed into it here and there a stepping-stone if the bed is large. A formal little moraine bed that will grow choice plants quite as well as the elaborate underground watered moraine will be the result. A minimum depth of eighteen inches I consider necessary for a serviceable moraine, and no good purpose is served by making it deeper than twenty-four inches. Such a moraine will retain a lot of moisture for a long time, and a can or two of water once or twice a week during Spring and Summer will keep the plants going happily, and quite as contentedly as in the elaborate structure with a constant trickle of water through it.—*Gardening Illustrated.*

PLANTS IN STEPS AND PAVEMENTS

IT was the example of the natural growth of small plants in the joints of steps and at the edges of pavements that led to their being so planted intentionally, and in very careful hands it is a charming way of gardening. What Nature does in this way is full of surprises, for it sometimes happens that what one would have considered a most unlikely plant places itself in dry wall or pavement and justifies its intrusion by a distinct success. But though plants will of their own accord do well in most unlikely places, when they are intentionally placed it should be with the fullest sympathy with what is known of their needs. It is also important that it should be done in strict moderation, for there are gardens that should be taken as warnings where the plants in pavements are so much in excess that it becomes impossible to use the paving for its original purpose as a place to walk on, and there are steps so much crowded with vegetation that no one can go up or down without some crushing or bruising of pretty plants. Plants are never so happy as when self-sown in the joints of stonework. Some rough sandstone steps lead up to a loft over a stable. They have a partial coating of Moss, but where they join the wall an accumulation of dust and various small debris have formed a little deposit of soil in which *Erinus* thrives, and this year is accompanied by the pretty wild Herb Robert (*Geranium robertianum*). Higher up in the same flight of steps a bush of Rosemary has come, also from self-sown seed, and has thriven so well that it has been necessary to cut back all the front branches to allow of free passage.—*Gardening.*

UTILITY AND COMFORT IN GARDEN SEATS

A SEAT is a thing meant to be sat upon. Whether it belongs to the garden or any other species, if it fails in fulfilling that object it is a redundancy. A seat within doors may be an impossible object as a seat and yet good art. In the garden it is wholly bad. Unfortunately for us, and our gardens, we have a great many of these latter to endure. They vary in uselessness and disfigurement, from the armchair clipped out of an unfortunate Box tree to that awful travesty, the "floral design," molded in iron. Between these extremes we have an infinite number of more or less painful (in more ways than one) objects called seats—objects they are which invade our gardens like an eruption, and oftentimes quite good gardens, too.

Even the soul of old Topiarius himself would writhe in condemnation should it, in visiting one of our modern gardens, come across one of his offspring, just as he himself would have condemned any other insane interference with the ethics of his ancient art. But let me not tread too heavily on the toes of any to whom the vegetable world in molded iron has peculiar attractions. These things are very well, perhaps, on the terrace. They may fittingly companion ye nymphs and storks and cemetery urns in stone, or plaster or lead. Of the "formal garden" they are a part; but don't, don't for the love of Nature, put them in the wrong place and by so doing commit the "ridiculous excess" of endeavoring to "throw a perfume on the violet." The "rustic" genus in wood, plain or peeled, twin-sister in deception of the living tree to its prototype in iron, is at best a thing that has neither beauty nor utility. Before you can

sit upon it in comfort it must be well upholstered with rug and cushion, and the only virtue it possesses is its short life. It dies young; and I hold it only slightly less abhorrent in the car-wig stage than it is when, as a specious imitation of something that never was on land or sea, it is rather more obviously a bundle of faggots and a pound of nails.

If you must, or think you must, invoke Nature in the making of your garden seat, then let the latter consist of no more than the bole of some fallen tree, some great rock tumbled as by an avalanche to the brink of your shady walk. And as they fall so let them lie. They will not be comfortable; if you fall asleep upon one or other you will probably have disturbing dreams, as Jacob had on his heap of stones, but you will at least have been honest in your effort to "copy Nature."

But there is no need to do any of these things; indeed, there are good reasons why you should not do so, and the first of these is: There are plenty of seats, good to sit upon, tasteful to look at and which will enhance the beauty and interest of even the wild garden without our indulging in obvious extremes or suffering for "art's sake" a hole in our trousers. Utility, as I have said, and comfort are the first essentials in a garden seat. You can secure both these in wood, iron and other material, but I prefer good honest wood even if you can afford the best of hammered iron. Let the craftsmanship of a cunning worker be expressed in every line of your wooden seat, but avoid any trickery in design, any flamboyant ornament. For honest workmanship in a garden seat is as pleasurable and satisfying a thing as enameled tiles and specious adornment in carving, plaster of Paris and glue are loathsome. In a word, your garden seat should be the creation of an architect, one who is also a gardener, if you can ever find such a happy combination. Like a beautiful house amid beautiful surroundings, it must possess no offending feature. It need not of necessity be fashioned so as to harmonize with its environments; indeed, it were wiser to have it so that it constitutes a contrast in line and color. Just as heavy Norman architecture is often admirable among the Gothic arches of towering Beeches, so a well modeled garden seat—the more severely plain the better—will give zest to the grace and subtle charm of a Fern glade. By contrast the one will give point to the other.—*The Garden.*

THE PRICES OF NEW PLANTS

MR. W. E. ARNOLD-FORSTER, in his article in *The Garden* refers to the prices of "novelties," using hard words which are unjustified and unfounded. As he mentions in particular an *Iris* sold at £5, and the only *Iris* sold at that price is Dominion, of which I am the raiser, perhaps I may be allowed to make some reply (I have no pecuniary interest in Dominion whatever). I know many who have bought it during the last two years, and most of them are not rich people. There is no question of snobbery or "bad form"; it is simply a question of whether a novelty is worth the price asked for it or not. The value of a novelty is most fairly measured by the cost of its production, and by its capacity for producing descendants of exceptional merit—its pedigree value. Dominion was quite a new break, and from the seedlings already obtained from it, it is not too much to say that it must be the foundation of the *Iris*es of the future; that is, no *Iris* will be able to hold its own against varieties of Dominion ancestry, except such as possess some special character that it may be found impossible to obtain in combination with the Dominion qualities—and this is not very likely. Hence the "pedigree" value of Dominion is difficult to estimate, and on that ground alone it is probably worth far more than £5, which, in view of the demand, is only possible owing to its good rate of increase. Compare the £50 for Daffodil Peter Barr, or a thousand guineas for a pedigree bull where the rate of increase is slower and more uncertain. Pedigree value, however, is a matter for experts, but the cost of production may be estimated directly and can be appreciated by all. I wonder if Mr. Arnold-Forster realises the cost of producing first-class novelties. There is no magic about it; new varieties may be obtained by anyone who takes the trouble to collect and sow seed, but to produce novelties of exceptional merit requires (like everything else of high quality) the exercise of intelligence and imagination and much patient labor. It is notorious that no one has ever made a living out of raising novelties alone, seldom indeed recovering out-of-pocket expenses, and for my part I do not see that there is any "honorable tradition" or "good form" in paying prices for novelties which do not provide a living wage for those who produce them. Why should raisers of new flowers alone be expected to give their work for nothing? They have no protection and cannot "patent" their productions, and what they receive depends ultimately on the prices at which the novelties are sold. It is true that the best work is seldom produced for gain and most breeders of flowers have worked mainly for their own interest and pleasure; but comparatively few are in a position to do so, and the result is both that the possibilities of breeding are greatly limited, and that many novelties of

second-rate quality are sent out. A good example is provided in the earlier part of Mr. Arnold-Forster's article, where he notes the prevalence of purples and violets in Delphiniums. This is to be seen in many other flowers also, and the reason is simply that these are generally the easiest to obtain, and if people do not pay a fair price for the best work—they will get just what they pay for. With higher prices breeders would "scrap" more severely and send out only their very best. And if this applies to flowers, which are interesting in themselves, how much more does it apply to improvements in fruits, vegetables and economic plants. If we wish to keep our country in the honorable position which it holds in the forefront of progress we must give due encouragement to the best work.—A. J. BLISS in *The Garden*.

DEPARTMENT OF BOOK REVIEWS

HORTICULTURE, by Kay Cadmus Davis, Ph.D.; large 8vo, VII+416 pages, with 287 illustrations; The Macmillan Company, New York.

The Foreword is especially worth reading, as are many prefaces, and as all introductions in books ought to be, of course. In this case there is particular advisability in grasping the author's preliminary point of view and in getting his help in the use of the book because it is designed as a textbook for schools and yet attempts to cover the entire field of studies that might in any way be ranged as horticultural studies; the growing of field crops and animal husbandry are not touched upon. Six chapters are devoted to preliminary studies and plant propagation; six chapters to vegetable gardening; six chapters to various phases of orcharding; four chapters to small fruits, nuts, etc.; one chapter to the home wood lot and forestry; and one each to soil improvement, the home and school grounds, weeds and birds.

This is certainly for one book an ambitious programme, the adoption of which is perhaps justified by the desire of some schools, teachers or students for a comprehensive survey of these important subjects condensed into the time of a one year course. It is fortunate that the author possesses unusual powers of summary and arrangement. What space obliges the omission of concerning any particular topic he provides for by giving references at the end of the chapter. These references are in a number of cases made up of the United States Farmers' Bulletins. They will naturally be supplemented by the properly informed teacher or intelligent reader of any class. Chapter X, Cool Season Vegetables of Early Spring and Fall, with its appended Exercises, Surveys and Projects, is comprehensive and thoroughly excellent. Chapter XI, Cool Season Vegetables that Endure Summer Heat, is even better. These chapters compose a garden manual as satisfactory as many others of several times their bulk. The treatment of fruits for different parts of the country is most successful; it is, for a brief setting forth of this interesting subject, very, very admirable and very valuable. Grapes are handled particularly well. For readers in the northern part of the country there is unusual interest in learning how fruits more tropical in nature are raised. In the table giving the qualities of apples, however, some varieties are not assigned as many merits as in the Ohio bulletin upon which the table is largely based.

The author's skill in condensation is at once evident in the first few pages which he devotes to a general treatment of botany, including the propagation of plants. In quoting Mendel's law, however, it is unfortunate that he stops short of telling that one-fourth of the offspring in the second filial generation, if smooth peas, permanently breed all smooth and one-fourth all wrinkled. In advising about the selection of seed corn he would better have counselled attention to the character of the plant rather than that of the ear alone. The picture showing bulblets forming upon a section of a hyacinth bulb has unluckily been allowed to get in upside down; the student would be misled and ruin his bulb.

Beyond a few incorrect spellings of words there are not many other oversights. On page 74 crimson clover is recommended as one of the best cover crops for growth in the Winter, even though, as is well known, it is regularly killed by freezing north of New Jersey. On page 147 it is not clear what is meant by advising that bulbs of narcissi, tulips and others started in January or February may be planted out in March. On page 152, still referring to the northern states, the same treatment is at least apparently recommended for the dahlia as is given columbines, larkspurs and other perennials that occasionally need division. Not all authorities surely would agree in ranking timothy among the good lawn grasses, as is done on page 376. In the planting table of perennial flowers one looks in vain for the chrysanthemum, the iris and the poeny.

A GARDEN OF PEACE, by F. Frankfort Moore; George H. Doran Company, New York.

"Intimate daily relation with the earth and the things that grow in it has always seemed the most fruitful soil of philosophy and contentment. Superficially this book may appear to be largely about a certain garden. It has much to do with that garden, but one discovers very soon that the paths all lead out beyond the garden confines in delightful excursions of talk—talk literary, talk artistic, talk dramatic. Shrewd, whimsical, with every little while a judgment of men or things that is sound and penetrating. A volume of mellow experience, of sane cheerfulness.

"For the Nature-lover the author's achievement in making a beauty spot of an old garden whose walls were part of an ancient castle, will be a genuine delight. Every bit of garden wisdom gleaned from the masters of Europe has been drawn upon and put to use. The illustrations have a charm all their own."

These words are copied from the publishers' announcement because the present writer could not write a better or a truer description of it. It is a stimulating, as well as entertaining, medley, from which, if space permitted, could be selected for quotation many "gems of thought." Here is one:

"After all, where is the joy of gardening apart from the trying? It was a great philosopher who affirmed, at the close of a long life, that if he were starting his career anew and the choice were offered him between the Truth and the Pursuit of the Truth, he would certainly choose the latter. That man had the true gardening spirit."

THE SOUTHERN GARDENER

By Henry W. Ravenel (Charleston, S. C., 1871)

The Library of the U. S. Department of Agriculture has lately come into possession of a little-known work: *The Southern Gardener* by Henry W. Ravenel (Charleston, S. C., 1871). This booklet of 64 pages undoubtedly answered a definite local need at the time of publication. Oddly enough, while all the American horticultural books of the 18th century originated below Mason and Dixon's line, the South produced comparatively few during the 19th. White's *Gardening for the South* (Athens, Ga., 1856) was probably not very accessible in the South of the seventies, although there had been a new edition by the Judd Co. of New York in 1868; in any case Dr. Ravenel's book offered in concise form and at a modest price all the necessary instructions for the culture of the vegetable and fruit garden.

The work is specially entitled to notice, moreover, because of its rarity; it was not in the Library of Congress, nor is it listed in the *Catalogue* of the Library of the Massachusetts Horticultural Society or in L. H. Bailey's bibliography in the *Standard Cyclopedia of Horticulture*. It is also interesting because of its author, Henry William Ravenel (1814-1887), who is best known as one of the pioneer mycologists of the South,—indeed, of the whole United States,—and collector and distributor of two priceless sets of fungi. He wrote a number of articles on fungi and on the flora of South Carolina, but his direct services to agriculture are less well known. For some time he was agricultural editor of the *Weekly News and Courier* of Charleston, he contributed largely to the *Rural Carolinian*, and for many years previous to his death was botanist to the South Carolina State Board of Agriculture. He gave addresses on agricultural and horticultural topics before various local societies, which with other contributions on similar topics printed in the newspapers, are nowadays hard to find, but an *Address delivered before the Aiken fruit-growing association*, which was separately printed (Columbia, S. C., 1859) is in the Library of the U. S. Department of Agriculture. His *Southern Gardener* was published without date, but a notice of the work appeared in the *Rural Carolinian* (v. 2, p. 646) August, 1871.

A LESSON ON SOIL IMPROVEMENT

(Continued from page 647)

ordinary hydrated lime while being less active is more or less effective upon all soils, although for those of a light sandy nature ground limestone is much to be preferred as the latter does not waste the organic matter of the soil by oxidizing it; also upon light soils ground limestone has a consolidating effect, acting like clay. Sulphate of lime, or gypsum should be used much more than it is. This form is especially active in liberating potash and phosphoric acid as well as other plant-foods, and it is the most desirable form of lime to apply to lawns, and, contrary to other forms of lime, it may be used in conjunction with stable, or other similar organic manures; in fact it is an excellent plan to mix it regularly with stable manure as it is removed from the stable inasmuch as it fixes and absorbs ammonia, thereby preventing it from being wasted. Gypsum is not, however, so active in correcting soil acidity, and when the line of soil improvement indicated is the reduction of acidity, one of the other forms should be used.

The uses of lime, either directly or indirectly, in soil improve-

ment are manifold, and the benefits to be derived from its application great. It is no exaggeration to say that the productivity of most gardens and farms would be greatly increased if sufficient attention were paid to liming; all crops would be greatly improved both in quality and quantity at a cost quite out of proportion to the value of the results obtained.

Deposits of earth known as marl are occasionally found. Marl is a mixture of disintegrated limestone and clay, and contains calcium carbonate in variable amounts. Sandy and peaty soils in the vicinity of such deposits can be greatly improved, both physically and chemically, by its application.

As before stated, soil is a mixture of inorganic and organic matter, the former being disintegrated rock and the latter mainly vegetable matter in various stages of decay. The term "humus" has been given to decayed vegetable matter in the soil and examples of soils having an extreme quantity of humus are seen in those of a muck and peaty nature. Humus contains a large number of organic compounds, many of which have had as yet but little study, but it is extremely varied in its composition. There is a great difference in soils as to their humus-producing power. Soils deficient in lime or alkaline compounds possess only a feeble power to produce humates. There is, too, a marked variation in the composition of the humus from different kinds of organic matter. Straw, sawdust and materials rich in cellulose and other carbohydrates yield a humus characteristically rich in carbon and poor in nitrogen. Materials rich in nitrogen, like animal matter, leguminous plants, and stable manure, produce a more valuable humus, rich in nitrogen and possessing the power to combine with the potash and phosphoric acid of the soil to form humates.

Formerly no value was assigned to humus as plant-food, but later investigations have proved that crops obtain a large part of their mineral food from the organic combinations contained in humus. The fact that plants feed on humate compounds, and that decaying animal and vegetable matter produce humates from inert potash and phosphoric acid of the soil, have an important bearing upon crop production in pointing out a way by which unavailable plant-food may be converted into more active and available forms, thereby saving the expense of purchasing fertilizers. This also explains one of the values of stable manure inasmuch as it makes the inert plant food of the soil more available.

Therefore a really rich soil must always contain plenty of humus, and any system of cropping which materially reduces the humus content causes a deterioration in its fertility. With the exception of peaty and muck soils, practically all are capable of being improved by increasing the amount of humus they contain.

Loss of humus from soils is caused by oxidation, and anything which accelerates oxidation reduces the humus content. In many of the western prairie soils which have been continually under grain cultivation for thirty or forty years the amount of humus has been reduced fifty per cent, and when land is continually under cultivation and no organic manures or vegetable matter added to the soil the humus is rapidly oxidized.

The physical properties of a soil may be entirely changed by the addition or loss of humus. Soils with little humus have small power of storing up water and resisting drought. The mechanical condition of heavy clay is vastly improved by the addition of humus-forming material, and humus benefits light soils by binding together the soil particles.

The least expensive method of increasing the humus in soils is by turning under green crops, and if these crops are some kind of leguminous plant, such as crimson clover, cow peas, or something of a similar nature, nitrogen is added as well; stable manure is also beneficial in this direction in addition to the actual plant food it contains. As we proceed in the direction of increasing soil humus, we have to guard against the effects of the natural increase in soil acidity, and, as above mentioned, the use of lime will then be indicated.

The decay of animal or vegetable matter in the soil always produces more or less humic acid, which acid is harmful to plant life when it continues long in a free state. Such acid is, however, beneficial to the production of available plant food inasmuch as it is capable of acting upon the inorganic matter in the soil and thereby becomes changed from a free to a fixed state, the latter stage taking the form of humates. The addition of lime not only assists in the decomposition of crude vegetable matter, but also at the same time affords a base for the humic acid to unite with.

The direct fundamentals in connection with soil improvement are, drainage, liming, and the increase in its humus content. These three act together in indirectly increasing the numbers of the beneficial bacteria inhabiting the soil, without which a soil, however chemically rich, is to all intents sterile. At the same time all the potentialities of any fundamental process of soil improvement may be nullified unless thorough and deep cultivation are continually kept up.

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Sanders Wertheim, Allenhurst, New Jersey, has become a sustaining member.

NASSAU COUNTY (N. Y.) CONFERENCE.

A conference of the members of the association located in Nassau County, N. Y., will be held on Thursday afternoon, July 28, at three o'clock, at the Nassau County Club House, Glen Cove, L. I., for the purpose of considering the organization of a local branch of the association in Nassau County. The purpose of this branch is to protect the interests and general welfare of the members of the gardening profession against interlopers who profess to be gardeners and also the so-called experts who offer their services in an advisory capacity while possessing but little more than rudimentary knowledge on what they tender to advise. This protection will be as beneficial to estate owners, many of whom, located in Nassau County, are members of the association, as it will be to professional gardeners. It is the aim of the promoters of this conference to give wide publicity to the activities of the local branch so that the estate owners may be kept informed of its doings and their co-operation secured towards elevating the standard of the profession.

PLANS FOR THE ANNUAL CONVENTION.

The committee in charge of arrangements for the annual convention of the association, to be held in New York October 11 to 14, has held several meetings to perfect their plans. As before reported the Park Avenue Hotel has been selected as the association's headquarters and meeting place for the convention.

While entertainment for the visiting members is not to be overlooked, there will be much business to be disposed of with particular attention to the future of the professional gardener in America.

Among the famous estates in Westchester County to be visited by attendants to the convention are those of John D. Rockefeller, at Pocantico Hills, and "Greystone," the estate of Samuel Untermyer, at Yonkers. A visit to some of the Long Island estates with a shore dinner at one of the seashore resorts will be part of the programme.

AMONG THE GARDENERS.

William C. Dickson has accepted the position of gardener to J. C. Bryden, Brooklandville, Md.

Ernest L. Lory has left the States for the Isle of Pines, Cuba, to take charge of the Mackey grapefruit grove and to look after the interests of a Jersey concern in its experimental cattle and pig farm.

George Baker, formerly superintendent of the George Eastman estate, Rochester, N. Y., has accepted a similar position at Loch-evan the estate of Spencer Kellogg, Derby, N. Y.

J. E. Shaw has been appointed head gardener of the Dominion Experimental Station, Lacombe, Alta., Canada, by the Civil Service Commission of Ottawa.

Carl Petersen has secured the position of gardener in charge of the vegetable garden on the Straus estate, Red Bank, N. J., under Thomas W. Head, superintendent.

Alfred Woodger has accepted the position of gardener on the Levy estate, Larchmont, N. Y.

George Wyness accepted position of gardener on the Mrs. C. A. Congdon estate, Duluth, Minn.

GARDENERS' EXAMINATIONS.

FOLLY FARMS, WAYS STATION, Ga., June 29, 1921.

Editor, GARDENERS' CHRONICLE:

In the June issue of the CHRONICLE the members of the association have been invited to express their opinions on the subject of examinations for gardeners. Having in mind Lincoln's version of a critic, I will leave criticism to others. No doubt there are quite a number of misfits in the gardening profession, yet it is generally admitted that gardeners as a whole are a very intelligent body of men. Personally, I think that the proposed examination for gardeners would be to the gardeners' advantage in the long run. Prospective employers would take more notice of a diploma backed by some of our leading professional gardeners than they would of the usual style of reference.

A lawyer or doctor must have suitable credentials before either can practice his profession. In my humble opinion a gardener who has to devote years of patient toil and study is entitled to a like representation. In my travels I have met with a number of professional gardeners who hold the same view on the subject.

I have great hopes that the association will adopt the proposed plan and I feel sure that our leading horticulturists will give the measure their hearty co-operation. J. C. ARMSTRONG.

SAUGERTIES, N. Y., June 24, 1921.

Editor, GARDENERS' CHRONICLE:

Some time ago I wrote you that I was very much in favor of the association instituting the examinations. At that time I thought it would be very interesting and a great help in elevating the gardener, and I think so yet, but I am afraid that there may be a selfish motive in it.

The arguments pro and con are all very good ones, but after reading W. H. Waite's letter I am convinced that he is right, and the idea of putting a man through an examination looks like a selfish one.

It would be easy enough for some of us to take a written examination, but the majority of good practical gardeners would find it a task.

There is too much prejudice in the world as it is, and I am afraid this would create more, as the gardeners with diplomas would feel that they were a class by themselves.

"Who are we that we should dare to put a man through an examination to know whether he is entitled to the name of professional gardener?" That sounds very reasonable and reminds me of a verse in St. Paul's Gospel to the Corinthians, I Cor., IV Chap., VII verse:

"For who maketh thee to differ from another? and what hast thou that thou didst not receive? Now if thou didst receive it why dost thou glory as if thou hadst not received it?"

I feel that we will have a better and a larger association without the diplomas, but I am ready to take the examination if instituted by the association.

I do like the spirit of Mr. Waite's letter, that kindly interest in our fellow gardeners, to give freely of ourselves, that others may be benefited.

CHRIS. KIEFER.

AMERICA FIRST

MELVINA HAMMOND

I'd like to see my native land
Before I start to roam
To foreign shores, so wide and grand;
I'd like to know my home.

I'd like to view this sightly land—
The land that gave me birth,
How can I, when on every hand,
Huge sign boards hide the earth?



Tell It Outdoors—Also

It is an outdoor age in which we live. In summer and winter, business or recreation takes us out and along the city streets or the country roads. The highways are thronged with motorists—and they are buyers.

Outdoor advertising, rightly done, is a good advertising investment. Our recognition of it as a medium of merit is best evidenced by the fact that last year we executed outdoor advertising contracts for our clients to an amount in excess of \$1,000,000.

Can we help you in solving your advertising questions—in this and other classes of media?

THE SIGN BOARD NUISANCE

Here we have a reproduction, reduced in size, of a full page advertisement of a national advertising agency (name omitted in the reproduction) which recently appeared in a trade journal to encourage the use of sign boards and poster advertising along our highways. This individual agency advises that the appropriation of its clients for outdoor advertising last year exceeded one million dollars, giving an idea what money is being spent in this particular field of advertising. It has been estimated that the total spent for outdoor advertising in 1920 was forty million dollars.

Those opposed to the desecration of our highways by the obstruction and spoiling of views of our natural landscape with the unsightly sign board will note with interest the suggested ideal locations sketched in the illustration—turns in the road—where the

automobiles might expect some open view of the country, only to find it obscured by a sign board. If this encroachment of public rights is not suppressed, we shall soon be confronted by a theatre of advertising as we travel along the highways. The nuisance will not abate, but continue to grow until public sentiment emphatically records its disapproval to make the advertisers realize with what disfavor sign boards along the countryside are regarded.

The National Association of Gardeners is completing its plan for a nation-wide "round-robin" campaign of protest against the practice of the sign board interests and national advertisers who are turning every vantage point along the country's highways into Monumental eyesores. The association will welcome the co-operation of all interested in this movement. Send your name to, Sign Board Committee, National Association of Gardeners, 286 Fifth Avenue, New York, and it will advise you how you can assist in spreading the opposition to what practically amounts to vandalism of the natural scenic beauties along our countryside.

NATIVE BULBS FOR MASS PLANTING

(Continued from page 634)

flowers. They thrive best in light, sandy, porous soil, and will grow either in sun or shade. If used for naturalizing, the proper location is one that slopes sufficiently to permit the water from heavy rains during the Summer months to run off quickly, so the bulbs will not be kept moist for any appreciable time during their dormant period. Mariposa Tulips grow naturally on mountain slopes, in regions where there is little or no rain during the Summer months, and this condition must be imitated as closely as possible to insure success in other parts of the country where the Summer rainfall is copious. If these charming flowers are desired for garden culture they may be protected from rain or artificial watering by covering the bed either with coldframes or some sort of thatch, or the bulbs may be dug after the blossoms have faded, dried out and stored in paper bags until Fall, when they may be replanted.

The two strains of *Calochortus* that are not only the hardiest and easiest to grow, but have really the widest variety and most gorgeous colors, are *Calochortus vesta*, and what is known on the Pacific Coast as the El Dorado strain. The flowers of *vesta* are from three to five inches across; the color is white, flushed with lilac or rosy purple, bright red at the center and purple-shaded on the back of the petals. European growers consider this not only the best *Calochortus*, but one of the finest flowers in cultivation.

The plants of the El Dorado strain grow from one to 2 ft. high and produce branching stems bearing the butterfly-like blossoms. Of these scarcely any two are alike. The colors range from white, through lavender and violet to purple and again through all shades of pink, to claret red.

The article in next month's issue will be devoted to native lilies and other Spring flowering plants which should be put in during late Summer and early Autumn.

There has, perhaps, never been a time when our public was so alive to aesthetic value in municipal enterprise as now. A civic pride has sprung up that bids fair to transform many of our cities. . . . As Senator —, to whom this movement owes so much, once said: "People are realizing the satisfaction which beauty gives in the common affairs of life, and their realization of this is increasing more and more." No longer, for instance, are they content "that the landing place of the stranger, whether by rail or water, should be the most forlorn, abandoned, and repulsive part of the town." In fine, "communities are no longer satisfied with the old method of accidental growth."—*The Unpartizan Review*.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD HORT. SOCIETY.

The June meeting of the Westchester and Fairfield Hort. Society was in reality a Spring Flower Show. The executive committee arranged for classes of seasonable flowers apart from the usual monthly competition. Entries were numerous in every class and the quality was of the best especially in the roses. Roman J. Irwin was the donor of the entire premium list and it is regrettable that Mr. Irwin was unable to be amongst us on the occasion to enjoy the splendid display.

James Tough staged a winning collection of herbaceous perennials, among which was a noticeable vase of *Campanula persicifolia*. Immense spikes of Hybrid Delphinium took the eye of everyone in the collection shown by R. Williamson, which gained second prize.

The prizewinners in other classes were William Smith, W. J. Sealey, Charles Adcock, George Hewitt, James Stuart, Duncan McIntyre, James Linane, John Rutherford and Jerome Murphy.

After the awards had been announced, President Jones called on W. J. Ashley of Mount Vernon, N. Y., to address the meeting. This gentleman, who is a graduate of The Yale College of Forestry, is also a practical landscape gardener.

In opening his remarks he congratulated the exhibitors on their wonderful display because he said he realized what hard work there was at the back of it all.

He told us of instances where he had planted gardens of perennials for owners who were under the impression because they were hardy they did not need the slightest attention; also how he had refused to do planting for some unless they employed a gardener to care for them, as it was heartbreaking to him sometimes when he visited some of his past work to find it a tangled jungle.

Mr. Ashley devoted most of his time to trees of the U. S. A., their habits and diseases that had proved very injurious to them. He spoke of how certain species which had suffered badly, had gradually seemed to have created a certain anti-toxin in their sap and were now becoming immune from ravages of this kind.

Owing to the late hour the speaker was not able to go into great detail, as he wanted to cover as much as possible. It is hoped that Mr. Ashley will be able to give us more of his knowledge at some future meeting when we will be able to have the lecture illustrated.

GEORGE HEWITT, Cor. Sec'y.

OYSTER BAY (N. Y.) HORT. SOCIETY.

The regular monthly meeting and Rose Night was held on June 15 with President John R. McCulloch presiding. There were two new members elected to active membership, Klass Ackerboom and Martin Kniper. The petitions of Benj. F. Wallace, John Wilks, J. H. Fleury, Alexander Richie, Antony Bulski and Cornelius J. Donegan were received.

Exhibits for the July meeting will be 12 mixed asters; 12 mixed gladioli; 12 tomatoes, 1 var.

The exhibits for the Rose Night were the best ever seen in this section. In the 21 classes there were 82 entries, with the awards as follows:

Class 1 Best 6 H. P. roses, white: First, John Sorosick, gardener to John A. Garver; second, Leon Lenoir, gardener to E. L. Winthrop.

Class 2 Best 6 H. P. roses, red: First, John Sor-



—Something New

A Ten-Ten Catalog of Greenhouse Plants and Orchids

SO many of you said such sound sensed things about our other Ten-Ten Catalogs that we have now made one on Orchids and Greenhouse plants.

In fact, such a number of you kept asking for just such a catalog, that we simply jolly well had to make it.

And now it's made, you'll find it a real friend when it comes to buying Orchids, Palms and Greenhouse plants in general.

If you are a regular shark on species and varieties, it's arranged so you can pick out exactly what you want in a jiffy.

If you are one of the many ones, who have just a nodding acquaintance as it were, you can turn to the Ten-Ten Groups and know that you will find there the ten best of its kind.

You can select from the ten, or order the complete group; which latter would in every case give you a choice and varied collection.

Furthermore, its arrangement and text are such that your employer will find it highly interesting. You know full well, that when they become interested, it's a lot easier to get the plants you ought to have. Drop us a card with your and your employer's name and address, and we will take genuine pleasure in sending you both this new member of the Ten-Ten family.

Julius Roehrs Co
At The Sign of The Tree
Box 20 Rutherford N.J.

osick; second, Geo. H. Hale, gardener to H. S. Shonard.

Class 3 Best 6 H. P. roses, pink: First, John Sorosick; second, Geo. H. Hale.

Class 4 Best 6 H. P. roses, any other color: First, Leon Lenoir; second, Geo. H. Hale.

Class 5 Best 6 H. T. roses, white: First, Daniel Watson, gardener to John N. Willys; second, Leon Lenoir.

Class 6 Best 6 H. T. roses, red: First, John Sorosick; second, Leon Lenoir.

Class 7 Best 6 H. T. roses, pink: First, Alfred Walker, gardener to H. C. Smith; second, Leon Lenoir.

Class 8 Best 6 H. T. roses, any other color: First, Leon Lenoir; second, Robert Honeyman, gardener to B. G. Work.

Class 9 Best collection climbing roses, 6 varieties, 1 spray each: First, Geo. H. Hale; second, Leon Lenoir.

Class 10 Best collection climbing roses, 3 varieties, 1 spray each: First, Geo. H. Hale;

second, John Forbes, gardener to A. V. Davis.

Class 11 Best vase climbing roses, 1 variety: First, Leon Lenoir; second, Joseph Stobo, gardener to Albert Strass.

Class 12 Best vase roses, arranged for effect: First, Geo. H. Hale; second, John Sorosick.

Class 13 Best collection of sweet peas, 12 varieties, 12 sprays each: First, James H. Andrews, gardener to Sterling Postley; second, James Duckham, gardener to E. F. Whitney.

Class 14 Best collection sweet peas, 6 varieties, 12 sprays each: First, Alfred Walker; second, David Watson.

Class 15 Best 6 sprays of delphinium: First, Geo. H. Hale; second, James Duckham.

Class 16 Best 6 peonies: No entries.

Class 17 Best vase hardy perennial cut flowers mixed: First, Robert Honeyman; second, Geo. H. Hale.

Class 18 Best collection strawberries, 3 varieties, 12 each: First, James H. Andrews; second, James Duckham.

Class 19 Best 12 strawberries for size: First, James H. Andrews; second, John Forbes.

Class 20 Best 12 strawberries for flavor: First, James H. Andrews.

Class 21 Best collection vegetables, 6 varieties: First, John Forbes; second, James H. Andrews.

Messrs. Alex McLeod, William McLeod and John Wilks were the judges. Carter's Tested Seeds, Inc., offered \$20 as prizes for the Rose Night; \$10 for the one winning the most blue ribbons, \$5 for the one winning the most red ribbons, \$5 consolation prize for the one winning the least number of ribbons with the most entries.

ARTHUR PATTON, Sec'y.

TARRYTOWN (N. Y.) HORT. SOCIETY.

The Summer Show was held on June 10th in the Masonic Hall, which proved to be one of the best shows the society has held. Competition in all the classes was very keen, and the quality of the exhibits excellent considering the long, dry spell and the cool nights we have had. Perennials were in great variety, there being seven entries in the class calling for six varieties. Roses both H. T. and H. F. were very good, and strawberries and vegetables were a feature. The judges were Geo. Middleton, William Scott, and H. Nicholls, whose decisions met with great approval.

The awards were as follows:

12 varieties of perennials: First, Thomas A. Lee.

6 varieties of perennials: First, Wm. Graham; second, Thomas Wilson.

3 quarts strawberries: First, James Murray; second, John Grant.

1 quart strawberries: First, James Murray; second, Alex Anderson.

Vase of H. P. roses: First, Thomas A. Lee; second, Edward Kane.

12 varieties of roses: First, Thomas Wilson; second, Edward Kane.

3 varieties of roses: 4 of each; First, Thomas Wilson; second, Alex Anderson.

3 varieties of roses: 6 of each; First, Thomas A. Lee; second, John Grant.

Six varieties of sweet peas: First, Thomas Wilson.

Vase of 50 sweet peas: First, John Thomas; second, Wm. Graham.

3 varieties of peonies: First, Thomas Wilson.

Vase of peonies: First, Thomas Wilson; second, Wm. Graham.

Vase of out-of-door blue flowers: First, Alex Anderson; second, Edward Kane.

6 varieties of vegetables: First, John Grant; second, Alex Anderson.

2 heads cauliflower: First, John Grant; second, John Thomas.

2 heads lettuce: First, Alex Anderson; second, Thomas Wilson.

Dish of peas: First, James Murray; second, Edward Kane.

THOMAS WILSON, Rep. Sec'y.

SEWICKLEY HORT. SOCIETY.

The regular monthly meeting was held June 14th and proved a most successful and encouraging meeting. Delphiniums, roses, cauliflowers and peas were the scheduled exhibits. Herman Rapp of Leetsdale carried off the major points for delphiniums and roses; with J. Barnett second with cauliflower and peas; and H. Gibson third with delphiniums and peas. Amateur classes were strong and a great variety of garden produce of high quality was staged by them. A display of sweet peas by J. Carman was truly a creditable one in view of the dry warm season experienced in this locality. Mr. Carman is a great enthusiast for sweet peas, growing many varieties, among them some that are not yet on the market, but forwarded him by certain growers to test.

Progress was reported by the Dahlia Show Committee and everything points toward a magnificent show during the first week in October, if Jack Frost only conducts himself as we all trust he will during the early days of the Fall. In view of the fact that the proposed chrysanthemum show



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would follow very closely on the dahlia show it was decided to forego a regular show and hold a chrysanthemum night at our regular meeting in November.

HENRY GIBSON, Asst. Sec'y.

ST. LOUIS (MO.) ASSN. OF GARDENERS.

The second outdoor meeting was held at the Municipal Nurseries, Chain of Rocks, St. Louis, on Sunday morning, July 3d. After a short business session the members were conducted through the nurseries by Ernest Strehle and John Moritz. Thousands of trees and shrubs are here grown for the embellishment of the St. Louis parks, and also trees for street planting. In spite of the late Spring frost which killed nearly all the leaves the plants seem to have thoroughly recovered and are making a fine growth. Methods of propagation and culture were explained to the members, and the value of the municipal nurseries to the city were pointed out.

The members also visited St. Louis waterworks park, where Mr. Goebel is superintendent of the grounds. The water and rock gardens as well as the rugged natural beauty of this park was much enjoyed by those present.

S. P. JENSEN, Cor. Sec'y.

SIOUX FALLS (N. D.) PEONY SHOW.

Spurred on by the unqualified success of the first annual peony show, the committee of Sioux Falls horticulturists met and decided to form a permanent organization known as the Sioux Falls Annual Peony Show association. The present committee will hold until officers are chosen later. It

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is the plan to have a bigger show each June and in two or three years, according to C. D. Symms, manager of the show, it will be possible to have sufficient peonies grown to decorate autos for a parade similar to the flower shows in the bigger cities. The idea of the show originated with the chamber of commerce and the horticultural association.

The show continues to attract great attention from its beauty and variety of flowers displayed in both private and special exhibits. Among the attractions is a model house, exhibited by the Sioux Falls Nurseries, stuccoed, shingles and a most attractive dwelling.

The awarding of the prizes shows how many excellent varieties were exhibited. The Otonka country place of A. W. Tut-hill, was represented by William Portman with a wonderful peony display that captured the sweepstakes, four firsts and a second. Mrs. Herman Freese took a sweep-stakes for best variety, two firsts and two seconds; Mrs. Fred Sherman three firsts and a second; while in the miscellaneous exhibits, Mrs. E. Maynard with four firsts, V. L. Peterson and E. O. Jones with three firsts and a second and three firsts, respectively, took leading honors.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

Can you tell me anything about the effectiveness of Melrosine in destroying rose bugs? I noticed in your last issue that one of your writers recommended Hellebore powder, and the shaking into kerosene as a method of destroying this pest. While I have in the past tried this and other such remedies I have found them only partly effective. Before experimenting with this new remedy I should like to learn something of its merits.—B. R. K.—New York.

The inquiries we have made from time to time among the gardeners who have used this product, have brought highly satisfactory responses. With such men as Mr. J. Horace McFarland, who stands eminent in the field of horticulture, and others also prominent publicity endorsing Melrosine, we believe that the merits of the product which the manufacturers claim for it, are warranted.—EDITOR.

Here and There

NEW ENGLAND'S HISTORIC TREES.

There are fifty-three single trees or tree groups which are considered worthy of being listed as historic trees of Massachusetts, according to a table which has been prepared by James Raymond Simmons. The particular reasons why they are deemed worthy of historical mention are various and curious.

Some connection with Washington is noted of several of the trees; the Springfield elm because he "stopped at the tavern"; the Washington elm at Cambridge, where he "took command of the American army"; an elm bearing his name at Palmer,

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where "Washington rested on way to Cambridge and addressed citizens," and Major Broad's elm at South Natick, of which it is recorded: "At this spot Washington congratulated Major Broad." The Deerfield buttonwood is hallowed, since here it was that "Washington watered horses."

The "elm by the little brown house"—such is its title—at Deerfield "stood beside an old Indian trail" and thus became famous. The Paxton elm at Paxton "marks the center of the State." Beaman oak at Lancaster is the "largest red oak in Massachusetts," while the Charlemont buttonwood recalls the fact that the first settlers of Charlemont "slept beneath its branches."

The Avery and Oakum oaks both served as models for their respective town seals. The Hubbard elm at North Andover has the "largest breast height diameter of any elm tree in Massachusetts," and under the Lafayette elm at Ware the French patriot "rested in Revolutionary times." Two very ancient trees are the Eliot oak, where John Eliot preached to the Indians, and the Endicott pear tree, planted by John Endicott in 1630.

A happy and charming fancy this to set down, in such phrases as Mr. Simmons has used, the records of these ancient oaks and elms of Massachusetts. To love trees is a fine trait in man, and to preserve them and their records a better one.

We can look forward to this plan being carried out all over the country. Future generations of Americans will have other such records of historic trees all the way from Maine to California. Possibly New York will take to boasting of its private primeval forest up by the Bronx, of which it is recorded that its trees have been standing beside the quiet waters of that stream since trees first grew in this part of the world.—New York Sun.

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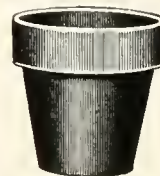
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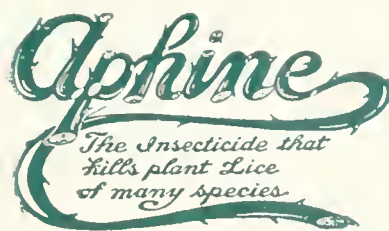
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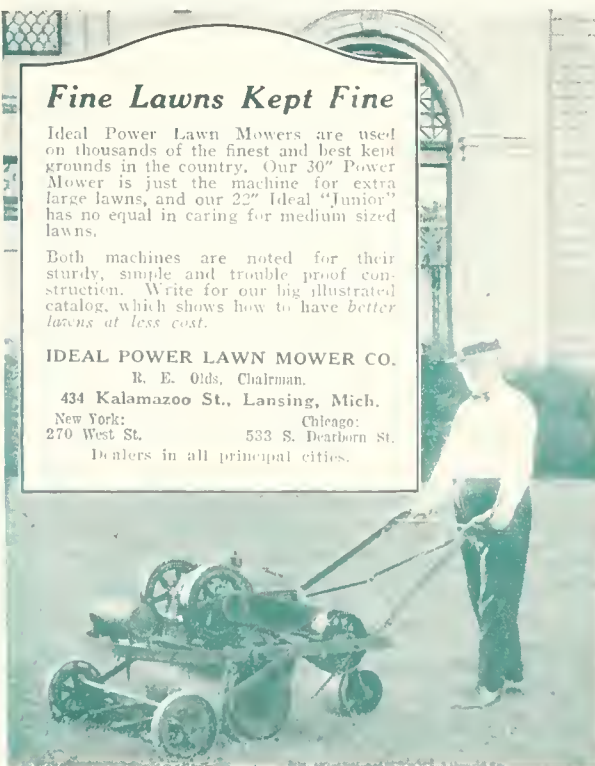


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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

AUGUST, 1921

No. 8

Things and Thoughts of the Garden

MONTAGUE FREE

IN conversation with the writer some time ago, H. E. Downer, who in former times illumined these pages with his horticultural wisdom, commented on the difficulty of initiating a discussion, that would be sustained, in the correspondence columns of the horticultural press of this country. He stated that on several occasions he had tried to "start something" but that no one had risen to the bait.

Those who try to keep in touch with garden affairs in Europe by reading the gardening papers realize that in England at any rate it is not necessary to be deliberately provocative in order to start a discussion on anything pertaining to garden matters. The closing months of 1920 were brightened for our British friends by a lively discussion in *The Garden* of the proper method of spelling the name of a well known white climbing rose. The name, *Félicité-et-Perpétue*, is French for the Latin names of the sisters Felicitas et Perpetua, who were early Christians martyred at Carthage. The fun was started in August by the reviewer of "Roses: Their History, Development and Cultivation," Rev. Joseph H. Pemberton, taking the author to task for spelling the name *Félicité Perpétue* in the body of the book and *Félicité-et-Perpétué* in the index. He stated that both were wrong and that the correct spelling was *Félicité-et-Perpétue*. In a week or two a letter appeared chiding, inferentially, both author and reviewer, saying that the real name of the rose was *Félicité Perpétuelle*, which in English would mean Perpetual Felicity. After this writer was disposed of, the discussion ranged on whether the name should be used with or without the conjunction. At this stage the interchange of amenities became rather amusing to the neutral reader, but not so to some of the protagonists, for they appeared to take the matter quite seriously and in some cases became extremely acrimonious. This wordy controversy did not die out until November and only after more than a score of letters had been published. After going through this correspondence the average reader would be apt to muse upon that phrase of Shakespeare's, so often quoted that it has become hackneyed, "What's in a name? That which we call a rose, by any other name would smell as sweet"; and think the subject of insufficient importance to warrant the waste of so much time, temper, ink and paper. It does illustrate, however, the readiness of British gardening enthusiasts to engage in discussion of matters pertaining to their hobby or profession. It also indicates that it is advisable for horticultural writers over there to be careful of the correctness of their facts or opinions before they allow them to be published—un-

less they are prepared to endure severe criticism. Perhaps it would be a good thing if garden writers here were exposed to the same salutary discipline.

* * *

In the Spring of the year an interesting correspondence, inspired by an announcement concerning the judging of vegetables, which appeared in the Royal Horticultural Society's "Book of Arrangements" for 1921, ran for two or three months in the same periodical.

The kernel of the proposal as it appeared from a letter in *The Garden* over the signatures of the President and Secretary of the Society was: "The Royal Horticultural Society has resolved to insist that at all its meetings vegetables shall be judged according to their fitness for table use and not merely by their size and external appearance. With this object in view it has been decided to ask the assistance of eminent chefs as judges in making its awards."

This is a subject (that is, the standard by which vegetables shall be judged) of more than local importance and concerns us as much as it does the British. We take it for granted that the chief object in holding exhibitions of vegetables is not to provide exhibitors with an opportunity of glorying in their prowess or of receiving monetary or other rewards, but for the purpose of maintaining and improving the quality of the product. If this is the case it is essential to have a clear conception of what we are driving at—a conception of what constitutes improvement in vegetables—and a code of rules that can be used as a basis in judging. Discussion of the problem may well serve to clarify our ideas on the subject.

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We have had the thankless task of judging vegetables "according to their fitness for table use" and realize a few of the difficulties with which one may become involved. Of course there is only one way to really judge a vegetable's fitness, and that is the method of the ultimate consumer. But it is admittedly out of the realm of practical politics to make use of this method, for, apart from the difficulty of staging an exhibit of cooked vegetables, where could we find judges, however strong their digestive organs, who would be capable of staying the whole course at a big show? In this connection one of *The Garden's* correspondents makes the assertion that there is "little commonsense value in vegetable shows, in fact they may be mischievous in perpetrating false standards owing to the preposterously false standard of judgment by outward appearances."

With some vegetables, however, it is possible to make a fairly good appraisal of their culinary fitness by their outward appearance. In those cases, kohlrabi for example, where we know that the palatability of the product is dependent in the main on its having been grown rapidly and without a check. Here the practiced eye of the proficient gardener will be capable of more discernment than that of any chef, however eminent he may be. In vegetables of this nature it may well be that the largest specimen is the best, for no one will question that a large kohlrabi (for example again) grown rapidly is better than a medium sized or small one grown slowly, which in consequence is wooden and stringy.

With some vegetables it is possible for the judges to make wise and just decisions by tasting the raw product. We confess to a partiality for raw sweet corn and when judging this delectable vegetable always make a practice of tasting as well as appraising by the outward appearance of the ear. Many sad experiences in New York restaurants, when we have trustfully and hopefully sunk our teeth into ears (of corn) of fair appearance and been deceived by masquerading field corn, have made us wary of judging this vegetable by its outward show. Similarly with peas, carrots and the salad vegetables, the sense of taste may be called in to assist the eye, but we cannot imagine a judge, however valiant and conscientious, overcoming his natural repugnance to eating raw such comestibles as asparagus, egg-plant and spinach or onion if he were likely to be called upon to go into society immediately afterwards.

The perplexities of the judge are oftentimes increased, when called upon to officiate at small shows, by the broadness with which the various classes in the schedule may be interpreted. For example, in a class calling for six onions, in all probability many different types will be represented. There will be small specimens of White Portugal, somewhat larger Southport Globes and Yellow Danvers, and specimens of Ailsa Craig or Prizetaker weighing anything from one to four pounds, all entered in the one class. What is the judge to do in a situation of this kind, supposing each variety of its class to be well grown and free from blemish? The small White Portugals are ideal for table use in some respects—mild flavored, suitable for cooking whole and of good appearance when served with cream sauce—an onion that makes a hit with the ladies. The Globe type onions also have their good points—they are good keepers, of fine appearance—utility onions of all round excellence. Perhaps they are rather more pungent than some, but this is an advantage when they are to be used as a flavoring agent, rather than as a vegetable. The Prizetaker type is admirable for eating from the hand (if there are any sufficiently barbarous to do such a thing nowadays) and unexcelled for braising or roasting. The problem is still further complicated by the fact that, if he is himself a gardener, the judge feels that he ought to take cognizance of the effort expended in the production of the larger bulbs. What would you do under such circumstances? Our course of procedure when in a quandary of this kind is to decide according to our personal taste, and, if it involves withholding the prize from the largest bulbs, get out of the town as quickly as possible!

Carrots are also liable to present some perplexing problems when one has to decide between the claims of taproot, half-long, and Oxheart varieties. Judged entirely by their fitness for table use the long carrots would probably be ruled out, but there is that lurking desire to recognize honest effort—to grow extra good carrots of the long rooted type involves deep preparation of the soil. The carrots that we personally consider fittest for table purposes are seldom, if ever, seen upon the exhibition

board. These are of the Chantenay type pulled when they are mere babies. Specimens not more than three inches long or three-fourths of an inch in diameter, and grown quickly without any check are the kind to make an epicure's mouth water.

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Just what constitutes an advance in vegetable production? Supposing there is no diminution in quality or flavor of the product, is large size an advantage? Some of the correspondents of *The Garden* seem to think it a distinct disadvantage so far as fitness for the table is concerned. One lady makes the point that large vegetables take more time and more fuel in order to cook them properly. This might be answered by saying that there is no reason why vegetables should be cooked whole—they can be cut into pieces of suitable size and then the small vegetable loses any advantage it may have in this respect. But then we have to consider whether cutting a vegetable previous to cooking impairs its value either from the point of view of its appearance when served, its flavor, its food value and vitamine content. In some cases it does, in beets for example, and perhaps in potatoes—many cooks aver that the only correct way to cook a potato is in its jacket.

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Some of *The Garden's* correspondents were inclined to be facetious. One, for example, suggested that the judges be accompanied on their rounds by "biochemist who should take samples and submit them to analysis. Points should be given for protein, and anti-scorbutic vitamins, etc., while the important question of the calories should not be forgotten." This is a phase of the subject that might have been of prime importance during the war, but now that more are engaged in the arts of production and food is less scarce, it can probably be ignored. It may well be, however, that in the future, with great increases in population, this may be the primary consideration in growing and judging vegetables.

It seems to us that a very important point that must be taken into consideration in any discussion of standards of value in vegetables is whether by the production of large specimens it is possible to obtain a large amount of food from a given area.

Whilst there was great divergence of opinion as to what constituted the ideal type and size in vegetables, the professional gardener correspondents, as might be expected, were a unit in declaring against the proposal to utilize the services of eminent chefs in assisting to judge vegetables. Edwin Beckett, who probably has more first prizes for vegetables to his credit than any other gardener, and is noted throughout the British Isles for the excellence of his exhibits, suggests, in effect, that if chefs are to judge vegetables it would be logical to ask them to judge the fat beasts at a cattle show; and he wonders what the farmers would say in such a contingency. We wonder, too, but could give a pretty good guess.

I once stood in a dome with different colored glass in each window. Thus four men touching each other might each see a different scene; a red ocean, a green city, blue fields, and yellow mountains. A rare man might climb to the top of the dome and see the whole circle of the landscape under the white light of a pure atmosphere. But most of us look through one window, each upon a different world, each world colored by our own individuality.

—Robert S. Barrett.

Hardy Alyssum

RICHARD ROTHE

INHABITING the dry hills and mountainous sections of Central and Southern Europe nearly all the hardy species of the genus *Alyssum* are Spring-flowering. With very few exceptions the dwarfy, branching, creeping and, in some instances, at their base, shrubby garden forms have stems and leaves of grayish hoary nature. Those meriting our attention most produce bright yellow flowers in close corymbose heads or simple racemes, the singular blossoms being cruciform.

Highly treasured on account of free-flowering habit are the dwarf compact-growing forms of *Alyssum saxatile*. Very showy as edging, or when employed for grouping near the edge of open sunny borders in formal gardens,

to give the plants time to get established before the frost stops vegetation. When aiming for full effect the first year and depending on Spring planting earliness in perfecting the work is equally important.

Though extraordinarily resistant as to the effects of hot weather and prolonged drought as well as damaging influence of frigid Winters, the cases of failure or even outright loss of plantations in our Middle Atlantic States are very seldom met with. We admire the luxuriant foliage of our Alyssums and how well it has withstood successive waves of mid-Summer heat without watering until, in the wake of a new wave, we have rainstorms in



Alyssum Montanum Grandiflorum



Alyssum Saxatile Compactum

Alyssum saxatile compactum and its lemon-colored variety *citrinum* have been favorites with generations of gardeners and flower-lovers. For dry-wall plantings and more so for the arrangements of brilliant vernal color arrays in our rock gardens, we consider the free use of "Basket of Gold" as simply indispensable. We joyfully greet the appearance of the first golden yellow tinge when *Adonis amurensis* unfolds its blossoms in February and March; we notice the gaining strength of it when added to flowering tufts of yellow crocuses and *Primula elatior lutea* in April. During the rapidly swelling crescendo at the beginning of May it needs the clear yellow masses of close corymbose heads of *Alyssum saxatile compactum* to vie harmoniously with the lavish display of blue, lavender, pink and white hues in the festive color symphonies which are to be the pride of our rock gardens along the open sunny slope.

Using Alyssums extensively it is necessary to make Spring sowings every year. Seeds germinate and appear above the light, sandy soil surface within a week to ten days. Expose seedlings to the full sun and open air as soon as possible and water moderately. Early in June, when of sufficient size, seedlings should be transplanted out in the open ground, the beds well manured and exposed to sunlight and air. Paying attention to the given conditions we are reasonably sure of having strong thrifty stock by the first of October. Alyssums when lifted out of the open ground, on account of the absence of a thick fibre root system, rarely hold any ball. For this reason Fall plantings should be made before October 15th, so as

brief intervals, the mercury rapidly rising after every storm. Soaking wet, while a humidity-laden atmosphere remains tropical, the luxuriant foliage is apt to damp off in a very short time. Plantations in dry-walls, on slanting ground, or otherwise favored by conditions to allow, excessive rainwater to run off quickly are comparatively safe. Alyssums on level ground should never be allowed to become crowded and care should be taken in keeping the weeds down.

Heavy manure or leaf covering is apt to cause similar damage in Winter. Protection by spruce or other ever-green boughs, or a thin layer of straw, allowing access of air, has proved a better way of procedure, while during exceptionally mild Winters plantations not covered at all frequently survive best.

The cultural directions and various conditions given above apply also to the variegated leaved form, *saxatile compactum* fol. var. and the very handsome double flowering, but rarely obtainable, *saxatile compactum* fl. pl. of gardens abroad.

Of the species coming under my European training the garden form of *Alyssum montanum*, *montanum grandiflorum*, seems to me well worth trying out in our climate. As shown by our cut it forms a small compact tuft, covered in May by blossoms in color deep yellow. *Alyssum Moellendorffianum*, a small silvery leaved creeping species, from Bosnia, covered by tiny little yellow flowers, no doubt, would be a welcome acquisition for some of our amateur plant collectors, while a dozen or more other species named are chiefly of interest to botanists.

Flowers as Food

GEORGE CECIL

IN certain countries, and more particularly in those on the far side of Port Said, comparatively little meat is consumed. The natives, however, spare no expense in flowers, which they eat—in one form or another—with a zest. Indeed, in various parts of India, and in Afghanistan, the cult of the edible flower keeps the aborigines busy for a considerable portion of the year, while the inhabitants of the Ionian Isles also devote themselves to floriculture for table purposes. In the South of France, too, the peasant horticulturists cultivate certain flowers for kitchen use; and the mountaineers of the Balkans follow their example with ardor. As to the Chinese and Japanese, their appetite for flowers, or, at least, for flower-flavored food, is enormous, a taste which the Egyptians and the Cingalese share with them. Nor are the people of Morocco behindhand in turning the occasion to account. Finding cereals improved by a flavoring of flowers, their native porridge is rendered appetising by the addition of a curious jelly (made from pomegranate flowers) which takes the place of the red-currant jelly of Europe.

As to the West Indies, where exotic flowers grow as thick as daisies or dandelions in England, flower dishes are in extraordinary request, the blossom of the banana, for instance, being converted into a strange confection, which is in enormous demand with all classes of the colored community. Pure-blooded negroes, octoroons, quadroons and mulattoes esteem themselves fortunate if they can include the delicacy in their morning and evening meal, while the highly-placed European officials do not disdain it.

As succulent as any of the flower confections is the rose-leaf jelly which figures in the *menu* submitted to the Egyptian *gourmet*. Prepared from the petals of red rose buds, well pounded and mixed with powdered sugar, water and isinglass are added, the toothsome concoction being poured into a small mould. If the cook is an artist in his particular line, he steeps a few tender, tiny buds in the jelly, leaving them in the mould. The dainty is served at the conclusion of the meal, being handed round on a great silver tray, and cut into small squares about the size of a marble. If the diner, like so many Egyptian gentlemen, has come under Europeanizing influences, he skewers each piece with a fork, or with a little sharpened piece of orange wood; but the ordinary Egyptian, who does not hold with (what he is pleased to term) new-fangled notions, prefers to use the natural knife and fork with which bountiful Nature has provided him. And he invariably enjoys his rose-leaf jelly.

In the North of India the aromatic flowers of a certain shrub—which grows almost wild—are actually made into cakes! A "dekshi" (saucepan) is filled half full with the blossoms, the rest of the space being given over to "ghee" (rancid butter) and a quantity of coarse "bazaar"-made sugar. The moment the butter melts, the "bowarchi" (cook) stirs the mixture with a long wooden spoon, which, alas! is by no means as clean as could be desired. More blooms are then added till the concoction attains the right consistency, after which it is poured on a well-greased dish, and allowed to cool. Finally, the saccharine mess is cut into squares, and sold to expectant customers at the equivalent of twopence a large chunk,

and consumed greedily. Incidentally, a meal of flower-cake leads to various stomachic ailments, which, however, the natives attribute to the interposition of Providence.

In agreeable contrast to the flower-cake of the Punjab is the candied violet preserve made on the Riviera. The petals are thrown by the handful into a vessel containing boiling sugar, and when the concoction has set in a brittle state, it is chopped into pieces the size of a sixpence—which are disposed of by the local confectioners to "folks as cares to buy 'em."

In China the lily is cooked as a vegetable, in water or in milk, according to the means of the diner, a pinch of salt and pepper being added at intervals during the boiling process. The Celestials also esteem the blossoms of the banana, dipping them in vinegar, and munching them at every meal. Popular, too, are candied jasmine petals with the Chinese; these being treated as are violet petals in France. Mention also may be made of the lotus jelly to be met with in Southern India, and which is considered a delicacy by the inhabitants, nearly all of whom are vegetarians. The petals are taken from the young flowers, steeped in well-sugared water, and then boiled till a very stiff paste is formed. After being powdered with sugar, the contents of the mould are let to set—and the local *gourmets* indulge in pleasurable anticipations. Truth compels one to admit that there are nicer things in the world than lotus jelly.

Certain flowers are converted into drinks by the Servians, lily-water being a favorite beverage with those Serbs who can bring themselves to forget the joys of the national plum-brandy. The petals are crushed in a tumbler till a slight alcoholic odor is exhaled, a little water being added, and, if the weather is hot, a lump of ice. To any but a Servian, lily-water tastes rather disagreeably, suggesting, as it does, the washings of a bottle which, in the dim and distant past, contained diluted brandy. There is also the old-English cowslip wine, a beverage which makes a strong appeal to those who like such things.

The Nepalese and the Lepchas—a monkey-like race to be met with in the Himalayas—cultivate the geranium for table use. Scorning the juicy fresh flower, they store the petals till they are as dry as *pot-pourri*; and when a respectable heap has been piled up, the colored *gourmands*, adding a few spoonfuls of molasses, boil the dried blooms, eating the mixture hot. Oddly enough, they usually live, not only to tell the tale, but to enjoy many a meal of the singularly unappetising compound.

Perhaps the most edible of all are the butter-blossoms, which the Cingalese gather during the "hot-weather," and reduce to a pulp by boiling, sweetening the concoction with sugar, and adding a flavoring of cinnamon or cloves—according to taste. Totally different from any Western dish, boiled butter-blossom is distinctly worth the attention of the white visitor to Ceylon.

There are great victories and struggles and noble acts of heroism done every day—in nooks and corners, and in little households, and in men's and women's hearts—any one of which might reconcile the sternest man to such a world, and fill him with belief and hope in it.—*Dickens*.

Native Lilies for Fall Planting

HERBERT DURAND

GENERALLY speaking, no other plant equals the Lily for unique and stately beauty, combined with exquisite grace. Yet it is safe to say that this regal flower is wanting in most gardens and is represented in many others by only a few of the commoner kinds, principally the Tiger Lily, the Madonna, or Ascension Lily (*L. Candidum*), and two favorites from Japan, *auratum* and *L. speciosum*.

Our superb American species are almost entirely neglected, but I feel confident that their merits will soon become better known and, when this has come to pass, they will be planted on an extensive scale. In fact, the discouraging news of the last week or two, from both Europe and Japan, telling of short crops and doubled prices, may lead to early consideration of our own species and establish them in their rightful place in popular esteem.

The species mentioned in this article come, some of them, from our eastern woods and meadows, some from the Allegheny Mountains and some from the Rockies and the Pacific Coast. All of them are extremely desirable for the hardy border if set among tall growing perennials; or among undershrubs, of sufficiently low growth to permit the nodding blossoms to show well above the mounds of foliage. It is in similar situations of stem protection and flower exposure that most lilies thrive, in their natural haunts. They are also strikingly beautiful grouped in front of and contrasting with the rich greens of Rhododendrons, Mountain Laurel and coniferous evergreens. And nothing is so well suited as lilies for naturalizing in wild or uncultivated meadows, and open woodlands. An ideal location is under, but far enough away from trees and tall shrubs to prevent the roots from robbing the lilies of nutriment and moisture. The best time of the year to plant the bulbs is during September and October, or as soon as possible after the seed has ripened and the foliage has yellowed and withered.

One of the many excellent characteristics of Lilies is their immunity from attacks of insects. They have no foes among the bugs. Wire worms and mice occasionally get access to and gnaw the bulbs, but in the aggregate the loss from such depredations is insignificant. The worst enemy of the plant is a fungous disease, which first shows itself as buff or rust-colored spots on leaves or buds and is followed by a grayish mold. If this disease puts in an appearance, affected parts should be ruthlessly cut off and burned and all the lilies in the vicinity should be well sprayed with Bordeaux Mixture. If Bordeaux fails, there is nothing to do but to pull them up and destroy them, stem, bulb and all.

For cultural purposes the native lilies, suitable and obtainable for eastern gardens are divided into two groups. In group number one I include four kinds, all of which, while they are happiest in a woodland glade, will thrive in any locality that is sheltered and partially shaded by deciduous trees or shrubs, or tall-growing ferns. They are also specially fine planted among Peonies, where, during the summer months, they supply brilliant color that would otherwise be lacking. They should be set so the tops of the bulbs will be four inches below the surface. The soil should

be light and well drained and it is good practice to surround the bulbs with an inch layer of clean sand.

L. Washingtonianum is perhaps the finest of the quartette. It is popularly known on the coast as "The Shasta Lily." Just imagine as many as twenty-five exquisitely fragrant and exquisitely beautiful bells, atop a six-foot swaying stem, its white, or pink, or wine-red coloring brought out in dazzling contrast, by a screen of rich green foliage behind, and you will realize what a queen *Washingtonianum* is. Next in height, and even more striking in color, is *Humboldtii*, var. *magnificum*. This Californian blaze of orange, red and crimson, might better be called "The Torch Lily," than another plant (not a lily) that is now so known. *Humboldtii*, under favorable conditions, reaches a height of four to five feet and well repays whoever is fortunate enough to secure it. *Kellogii* is a close relative of *Humboldtii*, but clothes itself in daintier apparel, its fragrant, reflexed petals being of a most delicate shade of pink. Its slender, wand-like stem is only three or four feet high, but each one produces from three to fifteen flowers. The fourth place in this group I have assigned to our own eastern red wood lily, *L. Philadelphicum*, whose flaming chalice is familiar to everyone who loves to wander over our forest-clad hills and mountains. This lily is unique in that it holds its large cup-shaped blossom perfectly upright at the summit of its sturdy two-foot stem. Its color is best described as a dazzling vermilion scarlet and when one comes across it in the wild, its brilliancy is actually startling.

My second group is made up of five lilies that are perhaps, most thoroughly at home on the margin of ponds or brooks, or in moist meadows, or damp openings in the woods. They thrive equally well, however, among ferns, or in the Rhododendron bed, provided the soil is kept constantly moist, as it should be. The bulbs should be planted about three inches deep in a rich, sandy loam, but at least six inches above the water table, or level.

Personally, I like our eastern Meadow Lily (*L. canadense*) best of all. It is the kind whose imposing candelabras of nodding red or yellow bells make our meadows glorious during July. It grows to a height of from two to four feet—enough so the tallest grasses are never able to veil its beauty. *L. pardalinum*, known as "The Leopard Lily," may also be styled the Meadow Lily of the Pacific Coast. Its stems are from three to six feet high and its flowers are very large and showy, of a rich, glowing orange color, each petal tipped and spotted with crimson. *L. Rocellii* is a rare western species, closely related to *pardalinum*, but with deep, blood-red flowers and very slender foliage. *L. Parryi* is unquestionably one of the finest lilies in the world. Its slender, leafy stem is from three to five feet high and carries from two or three to as many as twenty-five long, trumpet-shaped, lemon-yellow flowers, that are sweetly fragrant. Certainly an ideal combination of attractiveness. My final selection, but by no means the least desirable, is the gorgeous *L. Superbum* or "Turk's Cap Lily," of New England and the Atlantic seaboard. I have on my place this Summer stalks of this superb species over six feet high, and with from twenty to thirty-five of the brilliant, recurved blossoms to the stalk. I have seen it eight feet high with fifty blossoms! The ground color is a bright orange-yellow, spotted with brown and each petal is tipped with vermilion.

That Botanical Chap

FLORUM AMATOR

THERE came into our office not long ago one of those botanical enthusiasts, a stalwart young fellow closely approaching the seventies, who descants freely and easily upon the beauty and loveliness, and sweetness and the simplicity and grandeur of the vegetable kingdom. He points out incidentally that the animal kingdom cannot exist without the vegetable, and raises the question whether after all the vegetable kingdom and not the animal, is the highest work of God's creation, inasmuch as the former never commits such horrible crimes as that branch of the latter, called the human race, perpetrates. This botanist especially emphasizes the pleasure, and advantage of a thorough botanical knowledge of the vegetable kingdom and what a good habit it is to know from your youth up and call all plants by their scientific botanical names.

As soon as we had a chance to get a word in edgewise we ventured to say that we found it difficult enough to recall the common botanical names of plants without burdening our memory with scientific botanical nomenclature. He at once warmly assured us that it was just as easy to recall such botanical names as *Asclepias tuberosa*, *Liriodendron tulipifera*, *Acer rubrum*, *Geranium maculatum*, particularly if we note, as told in all good botanies, why the plants are called those names, as it is to remember Butterfly Weed, Tulip Tree, Red Swamp Maple and Crane's Bill, or Connecticut, Missouri, Dakota and Arkansas, and that a child of seven years learns the former names as easily as the latter or as the names of the States mentioned. We saw at once that his position on this question was impregnable and declined to argue the matter.

Next this botanical chap produced from back of his chair—he was awaiting us in our office where we arrived—a suit case, which he deliberately opened. This was crowded full of wild plants, most of which were in bloom, but some in fruit, and a few with foliage only. Either unconscious of the fact that we began hitching about in our chair, and reaching for a huge pile of papers which we had to go through or ignoring this, he picked up a plant and began talking and this is what he said: "This is *Scutellaria lateriflora*; its generic name comes from *scutella*, a dish, its calyx having a dish-shaped appendage, and its specific name from *latus*, side, and *flos*, a flower, because the flowers are mostly on the sides of the plant. Now after possessing yourself of this knowledge you should be able to readily remember the name, especially, if you studied Latin when in school, as every child ought to, because of its use in the sciences. The common name of this plant, which it is well also to note because we always remember a group of associated names easier than one, is Mad-Dog Skull Cap the first part given it because at one time the herbalist school of physicians believed this plant to be a cure for a mad-dog's bite, and the appendage to the calyx previously mentioned resembles a skull-cap as well as a dish. Now you have the little story, you can easily remember the name, can you not?" We mumbled our assent, and, encouraged by this, he took up plant after plant and remarked on them rapidly.

"This," he said, "is *Saponaria officinalis*; its first or generic name comes from *sapo*, soap, because the mucilaginous juice of this plant form a lather in water, and its second, or specific name, comes from *officina*, a shop,

because this species of this plant either entire or some part of it, can be found usually in apothecary shops. This name is in fact given to the species of many plants, kept entire or in part, i.e. root, leaves, flowers or seed, in apothecary shops, e.g., *Nasturtium officinale*, where the word has the neuter ending *e* to agree with *Nasturtium* which is neuter; instead of the ending *is*, which is both masculine and feminine. Now keep this fact about *officinalis* under your hat; it's useful knowledge. The common names of this plant are Soapwort, given for an obvious reason, and Bouncing Bet, because, we suppose, the children are wont to pull out the corolla from the tubular calyx and pinching the top of the calyx together with their fingers bounce it on the back of their hand causing the calyx to explode with a sharp report. There is another group of facts to remember; easy enough, too.

"This is *Mentha viridis*, and this *Mentha piperita*. *Mentha* is from *Minthe*, the name of a nymph changed according to the fable into this plant by the goddess Proserpine. *Viridis* means green, and *piperita* pungent, or peppery. The common name of the first is Spearmint, and of the second Peppermint. Note that the stems of these mints are square; this is true of nearly all plants in the *Labiata* or Mint family. Your twelve year old daughter Helen would easily remember these names and facts, and, of course, you are stowing them away in your head readily." Again we murmured very weakly an affirmative, at the same time thanking our lucky stars that when this botanist first began we had winked to our best stenographer, and she was taking down his talk *verbatim*.

Continuing he said, "*Ceanothus Americanus* is the name of this shrub; unfortunately the meaning of *Ceanothus* is obscure, so you will have to remember it as an isolated name unless you are clever enough to associate some other name with it; its specific name *Americanus* is, perhaps, given it because its leaves were used in place of tea during the American Revolution, and even after that war the preparation of these leaves for tea was revived in a commercial way in Pennsylvania, we think. The common names are New Jersey Tea and Red-Root, the latter given it because its roots are dark red. Speaking of remembering through association reminds us that we could not remember the name Mohair, that cloth out of which men's Summer suits are often made, till we associated it with the words bald head and we have had no trouble since; a bald head needs Mo(re)hair.

"A pretty little plant this; you will find it growing in waste sandy fields or in abandoned country roads. *Anagallis arvensis* is its name. *Anagallis* comes from *anagallo*, a Greek word, meaning 'I delight in,' and truly this tiny scarlet flower sometimes varying in color to blue, purple or white is delightfully pretty, is it not? Its second, properly speaking, specific name, *arvensis*, comes from *arvum*, a field. When you see the blooms of this little plant close up in full daylight, take along your raincoat, umbrella and overshoes with you for the flowers of this plant have the habit of closing quickly on the approach of bad weather, hence its common English name, Poor Man's Weather-glass.

"This plant which grows in wet meadows is *Mimulus ringens*. The generic name *Mimulus* is a diminutive form of *mimus*, a buffoon, this name being given this plant on account of its grinning flowers, and *ringens*

means gaping, because the two lips of this flower are open, and really reinforces the meaning of the generic name, *Mimulus*. The common name of this plant, Monkey-flower, is therefore quite appropriate.

"Here is a plant very different from the others; its foliage is sword-shaped, and of a glaucous-green color. This is *Typha latifolia*. *Typha* is from *Typha*, an old Greek name of uncertain meaning, which of course, makes it harder to remember; its specific name *latifolia* means broad-leaved. Cat-tail is the common name of this marsh plant.

"*Cimicifuga racemosa* is the scientific botanical name of this tall plant with white flowers. *Cimicifuga*, its generic name, comes from *cimex*, a bug, and *fugare* to drive away; the several species of this genus are reputed to drive away bugs; *racemosa* means that its flowers are arranged in a raceme, that is the flowers, each having a stem, are arranged along a central axis or stalk. The name applied to this genus as a whole is Bugbane, but to the species, *racemosa* is given the particular names Black Snake Root, and Black Cohosh."

In spite of our ill-founded prejudice against these scien-

tific botanical names and terms, and the huge pile of work confronting us on our desk we had begun to get interested in this botanist's talk, and asked him a few questions which he answered in such an easy, quiet and modest way that we were still further favorably impressed with the real value of botanical knowledge.

He then went on showing his specimens. "This," he said, "is *Brunella vulgaris*. *Brunella* is said to be derived from the German *braune*, a disease of the throat, for which this plant was supposed to be a remedy. This is a very commonly found plant hence its second name, *vulgaris*, common. In time, it would appear, its remedial reputation widened, hence its common name, Heal-All.

"Sorry that I cannot show you all my specimens," he said, "but I will have to stop right here in order to catch my train home."

"We have been much instructed," we said, "by your talk." "Have you?" he replied with a pleased look. "I will try then to call again some day," he said, "and bring some more plants and we will have another little talk." Perhaps he will; who knows? We would be more than half glad to see him again.

August Birds

PAUL B. RIIS

WITH few exceptions, the cares of the nesting season are over, the American Goldfinch alone putting off its obligations to posterity until this month. Its nest, composed of plant fibers and lined with fluffy thistledown may be found depending from the horizontal limb of the maple on the lawn or may be placed within the security of the taller thorns. But ever its happy proprietor will sing to its mate in undulating flight, circling the source of its joy.

Taking careful note of the visitors at the bird bath, one can see that their plumage is shabby and worn. Feathers of every description are scattered about. This is due to the molting of the plumage, which affects all birds at this time with this distinction, however, that adult birds take on their postnuptial plumage while the immature birds acquire their first Winter plumage. The mature plumage with these comes variably in the prenuptial, postnuptial or as in the case of the orchard oriole, at the second prenuptial molt.

Frank M. Chapman describes the process of molting in the lines following: "In its simplest form, and ignoring the comparatively few cases in which an essentially adult plumage is not acquired at or before the first prenuptial (Spring) molt, the molt among passerines may be summarized as follows: (1) Natal down, lost by postnatal molt, which brings the (2) juvenal or nesting plumage; lost by postjuvenal molt which brings (3) first Winter plumage; lost to a greater or less extent in some species by prenuptial molt, which brings the (4) nuptial plumage; lost by postnuptial molt, which brings the (5) second and subsequent second Winter plumage."

The change in plumage is very decided in such birds as bobolink, scarlet tanager, goldfinch and warblers, while with others it is a mere toning down and growing of white tips over the Summer attire, more in keeping with the desolate days to come. There is a decided feeling that the birds go into hiding at this stage as little song is heard, excepting that of the vireos, chipping sparrows, house wren, goldfinch and song sparrow. The molting process coming hard on the heels of an exacting period causes physical distress and depresses the spirit. No

household cares demand their attention and the time is spent in convalescence and retirement. The Baltimore oriole especially seems to disappear entirely at this time, leading many to believe in short migrations. Yet these migrations taking place North or South, East or West should replace our birds with others also migrating and thus no change be noticeable. But should you take the time to look them up in the woods or other natural haunts friend oriole will be found working closely among the foliage of the trees consuming numberless aphids. A little later snatches of song will more readily betray their whereabouts.

The swallows, purple martins and redwinged blackbirds are flocking, preparatory to their flight southward. The bobolinks, masquerading in the colors of the female are silently ranging the stubble fields in flocks. Their attentive debonair manners have changed entirely to that of listless flocklife. We should pass them unnoticed but for the momentary telltale, soaring pose which preceded its bubbling song but a few short weeks ago.

The movement South is gradually gaining impetus. The latest arrivals in the Spring are the earliest to leave. It is more difficult to fix the exact date of departure than the date of arrival, but one may always note the day on which a certain species was seen for the last time. Thus our notes for many Augusts for Northern Illinois record the migrations as follows:

ARRIVALS			
August	1 Greater Yellow-leg	August	23 Blue-headed Vireo
	3 Osprey		28 Northern Parula
	5 Semipalmated Plover		Warbler
	5 Wilson Snipe		30 Common Tern
	8 Philadelphia Vireo		31 Pectoral Sandpiper
August	14 Black and White Warbler	DEPARTURES	
	15 Least Tern	August	20 Least Sandpiper
	19 Black-throated Blue Warbler		22 Bank Swallow
	20 Yellow-bellied Flycatcher		24 Dickcissel
	22 Blue-winged Warbler		25 Purple Martin
			28 Roughwinged Swallow
			28 King Rail
			30 Yellow-bellied Flycatcher
			30 Whip-poor-will

The Landscape or the Signboard?

BERTHA BERBERT-HAMMOND

FOR those who possessed ample leisure and the important requisite, plenty of money, to migrate annually used to be quite the fashion, and among "social climbers" it was deemed almost a necessity. To go "abroad" and achieve being "presented at Court" was an "open sesame" to pass the portals of the "elite." But the recent war has made a change in this, as it did in many other things. Those who became afflicted with "wanderlust" had, of necessity, to limit their wanderings, and, through sheer ennui, some began to get acquainted with the many wonderful natural beauty spots of their native land. They found that our country has within its limits, scenery that, for grandeur and diversity, equals that of the Old World. The scenery along the Hudson, for instance (barring possibly the charm contributed by picturesque old castles), is very similar to that along the justly famed Rhine. The wild, scenic beauty of Yellowstone and Yosemite is matchless, and the sunny slopes and blue skies of Southern Europe find duplicates here. Indeed, within the boundaries of our vast country can be found beautiful scenery of every type.

As people traveled about this country they realized that while they had been neglecting the great possibilities of their native land, the American bogey, Commercialism, had not been idle, and that the aggressive advertiser had industriously secured, by the lure of gold, the privilege of defacing and obscuring the scenic beauty of our highways and detracting from the grandeur of the handiwork of Nature. No wonder "G. D. C." breaks forth through the columns of the *Boston Herald* with the following lament:

I do not like the colored signs
In every vacant lot,
They mar the landscape far and wide;
I wish that they were not.

In city or town, the country 'round,
In sunlight and in shade,
Are scouring twins, the cook that grins,
And pancakes "Auntie" made.

The salad oil time cannot spoil,
And fountain pens by scores,
Prime canned fish for all that wish,
Polish for waxing floors.

Then gum and jam and ham what am,
With pickles crisp and green;
The biscuits round, the cornmeal ground,
And Boston's famous bean.

Pure family soap and cigarette dope,
Varnish that lasts for years;
Home-made bread, chickens milk-fed,
It drives one quite to tears.

I do not like the colored signs,
They don't appeal to me;
America has scenery.
I'd really like to see.

The signboard nuisance has grown so flagrant and annoying that some decisive steps, other than legislation, must be taken to curb its growth and restrict its despoliation. Local signboard ordinances have not decreased the number or toned down the gaudy coloring and bizarre designs. These offensive signs are to be found in conspicuous places almost everywhere. The advertiser, on these vantage-grounds, resorts to all sorts of clever or unique tricks to catch the eye and hold the attention. By noting the articles so glaringly forced upon the sightseer,

and registering a vow never to purchase the articles exploited at the expense of marred natural beauty, the signboard may be made to act as a boomerang, and fail in the very purpose for which these blots on the landscape are erected. It is certain that as soon as this sort of advertising fails to pay, it will be promptly discontinued.

Those persons who, for a consideration, agree to permit the use of property for the purpose of defacing the landscape, are accomplices, and deserve the contempt of the community. Perhaps if the interpretation of the shrewd farmer, who surmised that his neighbor "was losing money on his produce, or he would not let the signman paint his barns," were to be accepted, there would be a decrease in the popularity of sign-covered outbuildings and fences,—an outward sign of poverty of æsthetic appreciation, at least.

The powerful weapon of public sentiment used in retaliation, can quickly abate this intolerable nuisance and make it possible to view the countryside without distraction, and every American can say, with pardonable pride:

I love every inch of her prairie land,
Each stone of her mountain-side,
I love every drop of the waters clear
That flows in her rivers wide;
I love every tree, every blade of grass,
Within Columbia's gates;
The Queen of the Earth, is the land of my birth,
My own United States.

FLOWERS OF A SUMMER NIGHT

NATURALISTS tell us that there is never absolute silence in the woodland, that the songsters, broad awake ere the dawn, filling the still air with the magic of their music until nightfall, and myriads of insects hovering o'er the streams with the first glimpse of sunlight, are all succeeded by other creatures that sally forth only in the gloaming to play their part and live their life under the curtain of night. So, too, at the hour of twilight, there are certain denizens of another kingdom—that of the flowers—which make their presence known, not so much by the splendor of their petals—that to the casual observer would scarcely be noticed by day—but through the sweet and subtle avenue of fragrance, as if shy of revealing their faces in the light. It is at the evening hour, when the after-glow still lingers in the western sky, when the day's work is done and quiet reigns, that it is pleasant to take one's ease in a garden. You may have left a city office, with its din of traffic without, and its more than accustomed worries within, or some large establishment where the duties have been unusually exacting and trying, you may even admit—to yourself—the day has gone badly, and you have left a longing for a respite from it all; yet when you have reached the seclusion of home, and entered your garden, you begin after a while to experience, what you have felt many a time, a sense of peace and rest akin to contentment. Explain it, someone says? Impossible! It may be strange philosophy, but we can give it no other designation than influence—the influence of the flowers; for are we not reminded that they

"Tell us with ingenuous grace
Of things splendid and undreamt of"?

Who shall say that flowers, some of which emit their

perfume so lavishly throughout the long summer nights, have not their own mission? We are inclined to think so. Surely that bed of Ten-week Stocks, upon which the dew is falling; those Sweet Rockets in the borders; the starry white flowers of *Nicotiana*; that edging of *Mathiola*; those few belated Pinks, almost rivalling old Clove Carnation; that breath, wafted from the Lavender bush yonder, never gave so rich a fragrance as when the flowers are almost hidden from view. Did we think when we brought the straggling Honeysuckle home and planted it, not without misgivings, that it would bloom so well in our garden? Let its sweet aroma answer. Have the Roses which have clustered round our window-frames along the years lost any of their elusive spell as they speak to us of sweetness in the quiet of the night? Has the Jasmine, with its countless white blossoms, that

"Keep their odor to themselves all day,
But when the sunlight dies away
Let their delicious secret out,"

ever seemed so fragrant as at this hour? What is it that suggests a scent as of ripe Apples? What can it

be but the pungent leaves on a bush which for years we have called familiarly "our Sweet Briar"? Did those spikes of Mignonette to which we gave a passing glance as we took a hasty survey of the garden before we left for business in the morning seem quite as rich in perfume as they do now, in the almost darkness, when there is nothing to betray their whereabouts, save the sweetness of their breath? What are those chaste white blossoms, so faintly discerned, that rear their tall stems, sentinel-like, in the evening hour? What but the Lilies could exhale fragrance so delightful? Well was it said of the Lilies by one in the long ago that, because of their transcendent beauty and simplicity, they surpassed in glory the magnificence of an earthly king, but who among us can compute their richness, or who can measure their exquisite odor?

Ruskin tells us that color is meant for our perpetual comfort and delight, and in the realm of beauty, as represented by the flowers, it is a wondrous charm; but there is something more than color which they possess. We venture to say that it is another attribute, in which all who love and grow them may share, and it is expressed in one word—Sweetness!—*Gardening Illustrated*.

Garden Paths

A GOOD path may be made with sawdust and cement. Take a quantity of clean sawdust, and divide it into two parts. Boil some tar, and with this make one heap of sawdust into a paste. Let it stand about one hour, and then add it to the second heap of sawdust, thoroughly mixing the two together. At the same time add clean coarse sand in the proportion of two bucketfuls of sand to one sack of sawdust.

Sprinkle the base of the path well with tar, and lay the cement two or two and a half inches thick. Sprinkle the surface with dry sand, and roll well, taking care to keep the roller wet to prevent the cement sticking to it. This may be done by hanging a wet bag over the roller.

For small gardens where durability and neatness, rather than artistic appearance are required, tar paths are to be recommended. The materials required are those necessary for a gravel path with the addition of coal tar as a binding material for the upper layers.

For a really good, firm tar-path, all the broken stone forming the top layer should be mixed with coal tar and cast into the trench, much the same way as concrete is prepared. A layer of clean gravel mixed with tar should be spread on the top, then a thin layer of sand, broken shells, or small stone chippings, to form the surface. This must be rolled with a heavy roller to consolidate the whole. If tar exudes while the rollings proceeds, spread on more sand to absorb the surplus.

The sand used in tar paving must be free from dust and mud, and the gravel be angular, if a firm path be desired. If the gravel consists of round pebbles, and the sand contains dust or mud, the path will be soft in hot weather, because such material becomes charged with an excess of tar. The work must be done in fine weather.

A grass path is a charming feature, especially when flanked on each side by a herbaceous border. Grass paths have a more natural appearance than gravel, and help to intensify the beauty and dignity of the surrounding vegetation. Wherever possible a grass path should be given the preference, unless, of course, it will be used much, in which case, gravel would answer best.

A grass path to be effective should be not less than three feet in width; six feet or eight feet is a still greater improvement. Grass paths are suitable for separating

plots devoted to fruit, roses or vegetables, and very pleasing indeed is their effect. When wheeling has to be done, planks should be laid down to wheel upon. Besides the charming effect, grass paths have the merit of cheapness, and, besides, there is no necessity for edgings.

There is nothing to equal turf as an edging to a path. If the edges are kept properly cut, the turf will have a neat and pleasing appearance. Even if a flower border or bed adjoin a path, it is a wise plan to have a strip of turf one foot wide as an edging.

Having properly constructed the paths, their future management has to be considered. For gravel or ballast paths, frequent rolling is necessary to ensure a firm, even surface. The best time to roll is right after a shower, or during showery weather, when the surface is moist. The material will set better then.

Paths should be rolled once a month, but if possible once a week is better. If it is necessary to roll in dry weather, give the gravel a good watering beforehand. Loose gravel or shingle should always be raked over before rolling to ensure an even surface. Weeds must be kept down with weed killer, hand weeding or careful use of the hoe.

Gravel walks which have been made for many years, and subjected to much wear and tear, will naturally have become uneven on the surface. Besides, the frequent sweepings to remove cut grass from the edgings, and fallen leaves, etc., will gradually have worn away the surface gravel or grit, and have left the sides somewhat loose and thin and blackened with soil. It, therefore, becomes necessary every two or three years, if not annually, to add a dressing of fine binding gravel to the surface.

When doing this, first loosen the surface with a rake, and make as even as possible. On this, place a thin layer of fine loamy gravel, containing a proportion of at least one-fifth loam to one of gravel. Lightly rake over and then roll well. This will make the surface fresh and smart in appearance, and produce an effect equal to a new path.—B. C. TILLET in *The Canadian Horticulturist*.

"Temperament is an explanation of things, not an excuse for things. We are as responsible for the use we make of a temperament as for anything else."

Work for the Month in the Garden

SAMUEL GOLDING

THE work in the garden during August is very similar to the work of the preceding month. We have now reached the time when we are enjoying the bounteous and varied fruits of the earth. We feast our eyes on the glowing colors of the autumnal blooms as they unfold. Yet, even while we reach the culmination of our garden season, we must look forward and commence to make plans for the coming year of 1922. Notes will be made of the success or failure of varieties of vegetables, which will serve as reminders when making out next year's seed list, and show where improvements can be made in our system of cropping and rotation. Our bulb order should be placed with our dealer to insure the supply for next Spring's display. The propagating bench must be made ready to receive cuttings of stock for next year's bedding.

But much remains to be done to carry out and complete the plan of cropping and successions until Jack Frost makes further work impossible. No opportunity should be lost in the vegetable garden to maintain a good supply until late in the Fall and to encourage the growth of those planted for our Winter supply.

Make the last planting of string beans. Although it is quite late, it may pay well to take a chance. Early frost may blight the prospect of a crop, but should the weather prove favorable, they will be a welcome addition to the table.

Sow more beets, horn carrots, endive, lettuce, spinach, and turnips. Cultivate between the rows of late cabbages, cauliflower, Brussels sprouts, and late corn. Remove all basal growths of corn and hoe up some soil around each hill, which assists and helps the top root action. It enables them to withstand the heavy winds in a measure.

Give celery abundance of water, and remove all side shoots. An occasional dusting of Scotch soot is excellent to deter the attack of the celery fly, beside being a fertilizer of value, which gives the plants that rich green color, so desired. When the soil is moist, add a covering of soil over the roots; then give a dressing of sheep manure or some other approved fertilizer. It will soon be noticeable how quickly the roots are working freely in this top-dressing. Earth up some of the early plantings, according to the demands which will probably be made later on. This should be done after a good soaking, giving the foliage time to dry. An occasional spray of Bordeaux mixture will prevent rust.

Transplant, or thin out, lettuce and endive from last month's sowing. As soon as the onion tops die down, pull them up and spread to dry, turning them over daily with a wooden rake, which helps the process. When perfectly dry, set in an open or cool shed, laying them out thinly, so that the air can play around them. They can be cleaned and stored away in their Winter quarters at convenient times.

Their place can be taken by a crop of late spinach: the variety "Prickly Seeded" is good for late work, as it is very hardy. As soon as the early potato crop is dug, and if the space can be spared, it is of the utmost value to us next year to sow a cover crop for digging or plowing in. Where good farm yard manure is scarce or difficult to secure, this is a fine substitute. It has been proved that cover crops aid production, are cheap, and insure a good supply of organic matter and nitrogen to the soil.

A leguminous mixture is fine; a mixture of rye and "hairy vetch" can be recommended.

The flower garden will demand constant attention, if the best results are expected, from now on until October. Copious waterings during dry spells with now and then a dressing of fertilizer will help the plants. Keep them well staked and tied.

To obtain large blooms of dahlias, they must be disbudded and given every encouragement during the remainder of the season. Look out for aphids and red spider, spraying the plants with Aphine to prevent attacks from these pests. Have them tied up securely so that they will not be injured by gales and heavy rains.

See that the late gladioli are staked, and the late asters, the branching type, is a most satisfactory one to grow for September blooming. The cooler nights with dewy mornings give them the needed time for proper development.

Give the rose beds a dressing of bone meal. Keep them well hoed to conserve the moisture and keep them free from weeds.

August is the month of the gorgeous lily, and they deserve to be more widely grown and known among the amateur gardeners than apparently is the case today. It is seldom that one sees them to any great extent, but their beauty is well worthy of a more prominent place. Their prices are moderate and they are of easy culture, providing they are given good drainage and plenty of leaf soil in their compost. Plant them at once, as soon as they are received from the dealers, about eight to ten inches deep and avoid the use of fertilizers. What can compare with the stately beauty of *Lilium auratum*, the chaste *L. speciosum album* and *rubrum*, *L. Batemanni*, *L. Henry*, to mention a few? Any of these varieties are real gems and would prove acquisitions of merit to gardens in the herbaceous border, or planted in spaces in shrubberies and rhododendron beds.

Commence propagating stock for next year's bedding. Cutting of coleus, alternantheras, heliotrope, fuchsias, lantanas, and all soft stock can now be raised. Seeds of pansies, English daisies, and such stock for Spring bedding, if not sown outside last month, should be sown at once in the cold frame. Sow seeds of *Delphinium* or other perennials in frames for next year's blooming.

Evergreens can be moved and replanted at the end of the month, or early September. The climatic conditions prevailing will necessarily have some influence on this operation. It is of great advantage to do this during a period of dull or showery weather.

Red spider has been very prevalent during the past season and evergreens, box bushes, and rhododendrons should be watched and sprayed with Wilson's O. K. Plant Spray.

Should any re-seeding of the lawns be contemplated, it can be carried out at this time, for good results are generally looked for from Fall sowing, if a thorough preparation has been given to the ground. Plough or dig as early as possible the land to be seeded, to give all weed seeds ample time to germinate; clean and harrow well; make firm by rolling; and rake over. This will give a fine, friable surface. Choose showery weather, for then the germination is very rapid. If dry, give artificial waterings to encourage a good growth before Winter sets in.

The Greenhouse, Month to Month

W. R. FOWKES

AUGUST is the humid month of the year, and with humidity we are very likely to have fungus diseases. Many of our Winter blooming subjects have reached the noonday of their existence. Beware of destruction which comes with this period. We are at this time of the year likely to be careless in small matters, but if we are to experience no regrets, we must pay attention to details.

Chrysanthemums have arrived at the bud retaining period, and August 20 is a safe date to retain the bud that will give a fine bloom at the proper time. Keep them clean and keep all basal growths picked off. Scrub the pots clean also, for so much depends on cleanliness. Tie up all growths neatly. Do not try to feed these plants with every kind of fertilizer that is advertised. Experts use less manure than amateurs.

Carnations, which were benched in April, need a little hydrated lime, but do not think of fertilizers. Many people like to grow that fine variety, "Laddie," but complain of its bad habit of bursting its calyx. My neighbor, Ernest Wild, grows the most remarkable "Laddies" I have ever seen in either private or commercial places, and attributes his success to early planting in good soil with bone meal incorporated, and no feeding of any kind administered afterwards. His other varieties were of equal merit, and it is proof that good soil, and clean, careful, daily treatment is more important than anything else. Remember not to pinch the shoots after August 20, or your crop will be late.

The first batch of Roman Hyacinths and paper white Narcissi should be potted the latter part of the month and placed out-doors under one foot of ashes.

Buddleya Asiatica should be placed in eight-inch pots, and allowed to branch, which will form large plants by November.

Plant a few cosmos, early kinds that have been left over, either six plants in ten-inch, or eight plants in twelve-inch butter tubs. They can be staked and grown out-doors until you expect frost and their lovely, graceful blooms will delight the eye in-doors for many days after frost has marred the beauty outside.

Sow a packet of the Spring blooming *Gesneria*, whose name is *Isoloma hirsutum hybridum*. The culture is the same for these plants as for Gloxinias, only easier grown.

Put into seven-inch pots, Canterbury bells, also *Campanula isophylla* and the variety *alba*. Grow in a frame until October and they will be useful and inexpensive.

At the end of the month, sow a few seeds of tomatoes. Varieties are legion, but there is one variety that excels all others. It is grown under several aliases, but its true name is "Carter's Sunrise," and to obtain the real article secure it from Carter's Boston. What few plants the average grower possesses should be of first-class quality and a good start must be made with high-class seeds.

Sow a few cucumber seeds, and grow on so that they will take the place of the worn-out ones. Many people now favor the indoor varieties in preference to the out-door ones.

Violets must be benched or potted this month. Shade the house until established. A short connecting house is suitable, running north and south. Allow sufficient space between the plants to permit their full development.

Stevias should be benched. Take cuttings of bedding plants; geraniums can be inserted in flats of sandy soil, covering the surface with half an inch of sand. Place the flats out-doors in full sunlight so that they will root nicely and can then be taken indoors at the proper time where they will live all Winter in the flats, providing they are free from heat and damp. Cool and dry is the correct atmosphere.

Sow *Streptocarpus* hybrids which will make a delightful showing in the Spring. Very sandy soil is necessary. They take about six weeks to germinate.

Take care of the *Hibiscus grandiflorus* and propagate from the half-ripened wood. You will have splendid flowers for table decoration throughout the Winter with little trouble.

Sow Heliotrope for standards. Maule's Giant is ideal for this purpose. It can be grown on without check, and will reach three feet in height by December. If kept fairly dry and cool all Winter, they will shoot ahead and make charming plants for many purposes.

Bonvardias and Lantanas of good favorite kinds should be cut back, and in a few weeks, will break nicely and give useful cuttings. The right way to propagate these plants is from very soft, young wood.

Repot any old Pelargoniums: the straggly ones need to be cut back well, and when the plants have made a new break, shake off the soil and repot into as small pots as possible. Grow very cool.

Beware of fungus in the rose house. Do not have moisture on the leaves at night. At the end of August fungus often makes its appearance, so lime should be blown between the plants with bellows after every good watering. Reduce the damping process until firing is started in earnest.

Give the Poinsettias, which are desired for Christmas bloom, a shift into six-inch pots. To a barrel load of soil, give a six-inch pot full of Ichtheme Guano. The bracts will be three times the ordinary size.

Cinerarias ought to be placed in six-inch pots. Be careful to drain these plants well; they are not very particular about the soil, if their drainage is clear. I always use a good amount of leaf mold with these plants and when in full vigor, apply Vermine to the soil once a week. The best position for them is a bed of ashes. They dislike a latticed bench.

Calla, the "Godfrey," that have ripened their leaves thoroughly while outdoors should now be shaken out and reported. They flower freely if placed in small pots; three bulbs in an eight-inch pot will do nicely. Enrich the compost with bone meal.

Eucharis amazonica in the warm house should be fed well, using soot water to guard against the mite, which destroys so many of this beautiful class of flowering bulbous plants.

Orchids must be kept absolutely clean. A lady remarked to her gardener when he was cleaning off the green scum on the pots, that she liked to see the green. He said, "Yes, so do the snails. They like a dirty pot." The lady was then assured that the gardener was right in removing every bit of the scum.

Be careful in watering the orchids as some of them

(Continued on page 675)

Insect-Catching Plants

WILLARD N. CLUTE

IT has frequently been said that the real rulers of this planet are insects, and there is much truth in the statement. Insect pests are everywhere. They injure our crops when growing, and again after they are harvested; they bring diseases to our domestic animals; they destroy our clothing and our furnishings; and swarm in every part of the earth.

So fond of the vegetation are the insects, that it is a wonder that certain forms of plants have survived at all. It does not seem possible, for instance, that the potato plant and the potato beetle could have originated in the same region. As a matter of fact, they did not. The survival of our familiar tuber-bearing plant is largely a matter of good luck, due to its beginning life in a region far removed from its most dangerous enemy. There are other plants, however, that are less vulnerable; in fact, some have developed most interesting devices for protecting themselves from attack. The heavy coating of hairs which cover the stems and the leaves of many species acts, in a large measure, to protect them from soft bodied insects, and the production of nauseous or poisonous substances in the plant may also serve in this capacity. In all probability the stinging hairs of nettles and similar plants protect them from insects. Certainly they protect the plants from larger animals. Regarding the poisonous species, however, it may be said that even these have their insect enemies. The tobacco worm, for instance, does not find chewing tobacco bad for its health!

In the tropics tables and their contents are often protected from creeping insects by placing each table leg in a saucer of water. The idea, however, seems to have originated with the teasels some millions of years ago. These plants have opposite leaves whose bases join together in such a way as to form little cisterns around the stems and these, filled with rain water, bar all comers. The catch-flies solve the problem in a different manner, being equipped with sticky zones on the stems between each pair of leaves. Any small insect which dares to venture out on these tiny vegetable quagmires is lost.

Not all plants capable of catching insects are content with mere capture. Many of them use the insects as food and, in so doing, completely turn the tables on the insect world by becoming the devourers instead of the devoured. The butterwort is one of the simplest of such plants. In this group the stem and leaves are covered with a slimy substance which is able to digest any small insects which may blunder into it. The flowers are often large and showy, but the stems are so slimy that in picking them one is likely to feel that he is disturbing the plant at its meal.

Probably the best known instance of insect-catching plants are found among the sundews, a genus of plants inhabiting cool bogs in the Northern Hemisphere. The tiny, round leaves of the common species are thickly set with reddish hairs, each of which bears a drop of glistening dewlike material at its tip. The incautious insect which stops to investigate the secretion finds itself stuck fast. In a few minutes the leaf begins to fold over its prisoner; a digestive juice is poured out, and in this impromptu stomach the insect soon becomes digested. A cousin to the sundew, known as the Venus fly-trap, does not have to depend upon a sticky substance to catch its prey, but has a leaf whose parts close so quickly that few insects escape, if they once fall into the trap.

The teasel cisterns seem designed only for protection, but the hollow leaves of the pitcher plant are adapted for drowning small insects and then digesting them. Some species even have a line of nectar, leading up to the tip of the pitcher, where the insects fall in. They are accused of mixing an intoxicating substance with the nectar to confuse their victims, a trick not unknown to more highly organized beings. Our native species, like the sundews, live in cold bogs, but the tropical forms are epiphytes and thrive on the branches of trees, high above the ground.

In muddy pools one may find representatives of still another group of insect-catchers. These are the bladder-worts, which bear great numbers of tiny bladders, each equipped with a door which opens inward. Small water insects push into the bladders to escape their enemies, only to find the door closed when they wish to retreat and their struggles fasten the door more firmly.

The list of traps employed by flowers to secure pollination is too long for inclusion here. In all cases they are designed to arrest the insect only long enough to dust it with pollen, but some of the traps have become overspecialized, as it were, and may hold their prisoners until they starve to death. The common milk weed is an old offender. Its pollen is gathered in small masses, attached to a sticky disc which is intended to cling to an insect's leg. Often the disc and the pollen fail to come out of the pocket in which they are set, and instead of being carried away to another flower hold the insect firm. Any milk weed patch will yield evidence of this nature.

A relative of the milk weed, known as the "cruel plant," has an arrangement something like an old fashioned boot-jack just above the nectar. The insect easily pushes its tongue down to the nectar, but when it attempts to withdraw it frequently slips into a V-shaped notch. The harder it struggles the more securely it is held. The common dog-bane has a similar trap and unintentionally catches many insects. Some of these prisoners in their efforts to escape actually pull their own heads off.

SUCCESS

It's doing your job the best you can
And being just to your fellow-man;
It's making money, but holding friends,
And staying true to your aims and ends;
It's figuring how and learning why,
And looking forward and thinking high,
And dreaming a little and doing much;
It's keeping always in closest touch
With what is finest in word and deed;
It's being thorough, yet making speed;
It's daring blithely the field of chance
While making labor a brave romance;
It's going onward despite defeat
And fighting staunchly, but keeping sweet;
It's being clean and it's playing fair;
It's laughing lightly at Dame Despair;
It's looking up at the stars above,
And drinking deeply of life and love;
It's struggling on with the will to win,
But taking loss with a cheerful grin;
It's sharing sorrow, and work, and mirth,
And making better this good old earth;
It's serving, striving through strain and stress,
It's doing your noblest—that's Success.

—The Rambler

Principles of Tree Growth

IN contrast with conditions in animal physiology, the life processes of plants, and particularly of trees, are understood only in a general way. While the student of animal nutrition can tell with rather close approximation what becomes of the foods the animal consumes, can measure the energy supplied or expended, can follow the building up and breaking down of various products, the plant physiologist's analogous knowledge is far less detailed. Our trees, then, familiar as they are to us, are less comprehended in their ordinary internal economy than are our animals. This lack of definite knowledge is reflected to no small degree in the diversity of opinions on many fundamental questions of practical orchard management.

Everybody recognizes the importance of soil as a source of plant food and will at once appreciate the important relation of soil to tree. Not so many, however, are aware that plant food is taken into the plant through the roots in liquid form only, consequently a tree may conceivably be starving in the midst of plenty because of a lack of solubility in the abundant food. The mere dumping, then, of a material containing an element of fertilizing value on the soil about a tree does not ensure a hearty immediate feeding for the tree, and in many cases the orchardist, not waiting the time necessary for rendering this food soluble and failing to see any response at once, concludes that his effort at feeding the tree was unnecessary and therefore wasted.

Again, a rather common sight is the accumulation of fertilizer or manure near the base of the tree. This is quite the usual thing, this putting the food near by so the tree can apparently get it conveniently. However, the main part of the absorption of raw plant foods is effected further out from the tree, where the small roots are more abundant. The rootlets that actually absorb the food are formed anew each year from the smaller roots; the main roots near the tree trunk do not grow these rootlets except on a few straggling branches. This arrangement is not always understood because the root system is almost entirely hidden from ordinary observation. But it should be remembered that the roots extend laterally as far from the trunk as the branches and that fertilizer is more profitably applied at some distance from the tree.

Aside from the soil with its nutrients and solutions, there is, however, another source of food supply that is frequently overlooked, possibly in part because it is so freely abundant that in ordinary orchard conditions it needs little consideration. Chemical analysis shows that a large part of the bulk of any tree is composed of carbon compounds, yet carbon is not known to be taken up by the roots at all. It occurs in the soil, but there it cannot be taken into the roots; it abounds in gaseous combination in the air. From the air then it is taken into the leaves where under the action of sunlight it is broken up; the oxygen which was linked with it is returned to the air while the carbon is retained. The presence of carbon in every smallest piece of the tree shows that it must be moved from the leaves, down into the wood in some way since it cannot be taken in otherwise.

What actually occurs is this: the sap taken up by the roots, largely water with its dissolved mineral substances, moves upward through the area known as sapwood. The current extends through all the branchings of the tree until the sap reaches the leaves. Here in the presence of sunlight chlorophyll, or green coloring matter of the

leaves "digests" this crude sap, combining and breaking down various products, forming several substances of which starches and proteids are perhaps most prominent. These accumulate during the day to a greater or less extent in the leaves, but at night when starch formation has ceased the stored supply is moved from the leaves in solution, forming what is known as the "elaborated" sap, flowing downward.

When a branch is girdled, either by killing of bark, by removal of a ring of bark or by a wire twisted tightly about it, there is a marked change in its behavior. If the injury is not so severe as to prevent healing over there is checking of vegetative or woody growth with a tendency toward fruitfulness. The tissue below the girdled part tends to react in the opposite direction; it is apt to send out suckers or water sprouts. The downward flow of elaborated food material has been interrupted and the two reactions tend to show the relative effects of each. Sometimes the growth of a sucker at a desired spot can be induced by girdling above this point.

Much of this food material is stored in the tissues of the tree until needed, partly in the twigs and partly in the wood of the larger branches and in the trunk. The medullary rays frequently abound in it. Here it may be drawn upon when needed. No greater mistake can be made than in thinking of the tree in Winter as inert. It is truly dormant, but it is no more dead than is a hibernating woodchuck. All through the Winter it tends to accumulate moisture in its tissues until it reaches its maximum content just before the buds break in the Spring. In some trees the sap accumulates in such quantities as to be actually under considerable pressure, as is shown by the bleeding of these trees when wounded. At such a time sap will travel with considerable speed, as is shown by chemicals introduced as tracers at one point in a tree trunk being recovered at a point a foot above in about ten minutes.

The tubes through which the sap flows are arranged longitudinally of the trunk as is indicated by the grain of the wood. Means of direct flow around the tree are not provided and the sap meets some little difficulty in moving to one side or the other. Hence a change in conditions at any given point is not so likely to be felt markedly to one side as it is above or below.

It has already been indicated that the treatment of the tree must be approached from a somewhat different viewpoint from that used in handling an animal. The animal is considered as a unit. The same viewpoint perhaps can be held with the tree so far as its soil relations are concerned and so far as it is fed through the roots. However, when the orchardist considers the treatment of the top it must be with a more complicated condition in mind. The case of one limb or one part of a tree bearing in alternate years from the rest of that same tree is rather common. This points to a degree of independence in the aerial parts that must be considered in pruning. If all the tree is cut back uniformly the response is uniform, but if part is cut back heavily and the rest undisturbed, or only slightly cut back, the reaction is not uniform. This quasi independence must be kept constantly in mind.

In the animal one set of digestive organs supplies the whole body, one heart pumps the blood, and so on. In the tree one set of roots gathers the crude sap, but there the likeness stops. Each branch, each spur has a strong

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Disbudding and Forcing the Dahlia for Exhibition

MANY amateurs desire the largest and finest quality Dahlia blossoms obtainable, so the following may prove of value to both amateurs and professionals.

To obtain the largest and most perfect flowers, only the best and largest buds should be allowed to mature; the others should be removed, enabling the full strength to develop the most promising buds into exhibition blooms.

Some varieties of Dahlias require thinning and disbudding, to produce the best flowers. Varieties having an excessive amount of foliage and small growth should have a considerable part of their branches removed, while those having more buds than can be properly developed or matured should be disbudded. The operation in no way endangers the plants and any one can do it. Thin and disbud if necessary, moderately or severely as conditions seem to require.

Taking a budded stalk or branch, you will find the large or first bud on the stalk, and also, that at each leaf all the way down the stalk, new shoots or bud stalks form; these in turn produce buds and flowering stalks, which overtop the first bud. The first bud on every stalk is always the largest and produces the largest and best flower, ordinarily. Before the first flower is in full blossom, the first two side shoots have formed buds and burst into flowers. These in turn become passé, to be replaced by flowering stalks from the set next below, or the second pair of side shoots.

On most varieties the first flower has a short stem, and we disbud to lengthen the stem and to secure larger flowers. The proper way to disbud is when the first bud is small, the first pair of side shoots should be removed with a sharp knife. This forces all the plant life that ordinarily would have developed the first two side shoots,

into the first bud, making the first flower much larger and giving it a better stem. Removing the first set of buds forces ahead the second set and they in turn burst into flower. As you cut and remove the flowers, your plants send forth new flowering stalks from the bottom of plant; the more you cut the more flowers will grow.

Disbudding is more generally used for flowers for exhibition purposes. When wishing the largest flower possible, for exhibition purposes, you can disbud every side shoot down the entire length of the stalk, forcing all the plant life that would have developed all its flowers, into one flower, thus growing one flower of gigantic size; or, a portion of the side shoots can be removed. This disbudding in addition to forcing insures you much greater success at exhibitions. In forcing Dahlias to secure the very best results, apply either fertilizer or manure, or both, broadcast or in liquid form, at each or every other hoeing, which with disbudding will give you the best results obtainable. Nitrate of soda proves a very effective fertilizer for forcing, but should not be used in too large quantities. Apply in liquid or crystal form when plants are in bud, making application often, and not using too much at a time. Nitrate of soda is powerful and if too much is used it will burn your plants or force them to such an overgrowth that the roots will decay during the Winter. The nitrate of soda crystals are best applied if a small ring is made around the plant, and these placed in the ring that keeps them from washing away, so the plant will receive the entire benefit. If in liquid form, using one tablespoonful of nitrate of soda to a gallon of water, applying with sprayer or watering can. Anyone can grow Dahlias of exhibition quality if they will digest these remarks, study plant requirements, and act accordingly.—J. K. ALEXANDER in *The Flower Grower*.

Fertilizers for Grasses

IN the March 3 issue of the *Canadian Florist* appeared an article on the use of ammonium sulphate on lawns instead of nitrate of soda, as a means of eliminating weeds. This article originally emanated from a bulletin by the Rhode Island Experiment Station, and went the rounds of the press. It now appears, however, that the method is not so efficacious as suggested.

The Central Experiment Farm, Ottawa, has the following to say:

Sulphate of ammonia is the fertilizer to which the wonderful influence is attributed. Furnishing nitrogen in this form instead of by nitrate of soda, an acid condition of the soil is promoted—which, if intense, discourages the growth of practically all cultivated plants.

Two grasses, however, were found to persist despite the acidity created in the soil—bent and fescue, grasses unlovely at best. Clovers and the better grasses, as well as certain weeds, were exterminated.

Lest any, having learned only half the truth, should proceed to transform their lawns by the method suggested, be it remarked that unless bent and fescue grasses are present and the owner of the lawn has decided that these are preferable to the more "velvety" kinds, the experiment is likely to prove disastrous.

Respecting dandelions, which many regard as the most

troublesome and persistent weed in lawns, the Rhode Island bulletin has this to say:

"Dandelions and plantains are often troublesome weeds, but apparently are checked by a degree of acidity which is not especially detrimental to the growth of bent and red fescue. To check eventually the growth of these weeds it is only necessary to introduce sulphate of ammonia into the top-dressing in place of nitrate of soda. This procedure will, of course, at the same time check the development of certain grasses like blue grass and also of clover." "Apparently are checked" offers but little hope of getting rid of dandelions by this means.

The following statement from the same source is significant:

"The sulphate of ammonia in the fertilizer apparently 'burned' the grass, for the trouble did not exist where nitrate of soda and blood were used as sources of nitrogen. . . . The burning was especially noticeable in clover." This "burning" action might well deter one from using sulphate of ammonia as a top-dressing. The mixture used consisted of 250 pounds sulphate of ammonia, 400 pounds acid phosphate and 250 pounds muriate of potash per acre—a heavy dressing.

The superior influence of nitrate of soda has been irrefutably attested in the records of more than half a cen-

tury from the famous grass plots at Rothamsted, where the sulphate of ammonia plots have always been inferior to those treated with nitrate of soda. In dry seasons the difference is most pronounced, and excavations revealed a deeper penetration of the grass and clover roots in the nitrate plots and explained the greater susceptibility to drought of the grasses on the sulphate of ammonia plots.

"The continued use of ammonium sulphate tends to produce an acid condition in the soil," says Professor Harcourt, O. A. C., Guelph, in speaking of the Rothamsted experiments. Dr. A. D. Hall, at one time director of that station, wrote as follows: "On the grass plots at Rothamsted, for example, where the manuring has now been repeated year after year for fifty years, very distinct types of herbage have associated themselves with the two manures. Putting aside the prevalence of sorrel as due to the acid conditions, the characteristic grasses on the plots receiving ammonium salts possess a shallow-rooted habit, e. g., sheep's fescue and sweet vernal grass.

"I well remember in going over the fertilizer plots at Rothamsted, noting that the plots on which ammonium sulphate had been used continuously carried very little grass and, what there was, was very shallow-rooted. Of course ammonium sulphate will tend to increase the growth of grass, and if this becomes luxuriant, as it would, it would choke out the weeds. Anything that will increase the growth of the grass will tend to choke out the undesired forms of vegetation. It is quite possible, however, that after a few years of continued use of ammonium sulphate the soil may have become sufficiently acid to destroy growth of legumes and of many kinds of weeds without destroying the quality of the grasses, but it is evident that if continued for a long time even the grasses would be destroyed."—*Canadian Florist*.

PRINCIPLES OF TREE GROWTH

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tendency to do its own digesting of the crude food products and seems to be limited in the extent to which it can draw on other parts for these substances. The intelligent pruner, therefore, perhaps unconsciously recognizing this principle, aims to provide each part with the conditions necessary for its best development. Since sunlight is necessary for its best development, he thins his tree so that every spur has its chance to digest its own food, for experience has taught him that it stands little chance of calling upon other parts at the time food is most needed. Remove the leaves early in the season from a spur and see what a poor apple it develops. Thinning out one side of a tree is of no help to the other side unless this thinning happens to admit more light to the unthinned side.

The isolation of each branch may be utilized by the skillful pruner in many ways. To cite one case: he may be confronted by a forked branch, both limbs being of equal size. This forecasts, sooner or later, a bad crotch. If he cuts them back uniformly the response is uniform and the condition is not improved. Let him cut one more heavily than the other. In the Spring both draw upon the accumulated reserves of the tree and push into growth. The longer limb, however, having a larger leaf area, has a stronger "pulling power" for ascending sap and the same larger leaf area gives it local superiority in elaborated foods. The result is that it outstrips the limb that was cut back more heavily, and will in time relegate it to the position of a minor side branch.

As the trunk enlarges the wood at the center loses its vital functions and retires from active participation in the tree's life. This area roughly comprises what is commonly known as heart wood and its chief function

becomes simply the supporting of the tree; reinforcing the more active tissues. That this part is not absolutely essential is easily understood upon recollection of hollow trunked trees, which are quite vigorous.—F. C. BRADFORD in *American Fruit Grower*.

THE GREENHOUSE MONTH TO MONTH

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have completed their growth, and the sheath is apparent. Less water now. *Dendrobium phalaenopsis* has perfected its bulb, and the spike is at the apex. Protect them from snails with cotton batting. One who is careful in watering takes into consideration the state of the weather; the orchid's growth, whether growing or resting; the kind of house it lives in; and every little item. If you are not careful with watering, you are not a successful grower.

Hang *Cattleya gigas* against the open ventilators, where they can take their rest and break in fuller vigor than ever.

PROPAGATING FERNS

THERE are several ways of propagating ferns, some being more suitable to certain genera than others. This article will be confined to a description of one method, which is probably the commonest, and certainly the most interesting.

Spores (so called from the word "spora," a seed) closely resemble seeds. Whereas, the former, however, include in their structure both an embryo (or young plant), protoplasm and an outer covering, the latter is actually the young plant in a very minute form. Seeds also produce flowering plants—spores otherwise.

The formation of the spores is as interesting as it is complex they are generally found on the undersides of the fronds or leaves, as they are commonly though incorrectly termed. The time to gather them is as soon as they turn brown, but before they become over-ripe and burst. Including the frond, they are put in a paper bag for a few days to dry, but should be sown as soon after this as possible to get good results.

Shallow pans are the best receptacles in which to sow them. Half fill with clean crocks and cover with a mixture of peat and leaf-mould, with the addition of a little sharp sand, or, better still, broken bricks, to keep it open and sweet. This should be sterilized by immersing in boiling water or baking in an oven.

In sowing the spores, take care there is no draught, otherwise being so small and light, they are liable to get lost. Cover the pans with a sheet of glass which should not be removed till after germination, as foreign spores are liable to be blown in and crowd the others out.

The first thing to be seen when germination has begun is a growth called the "prothallus," which looks like common moss. Before the first true frond appears, these should be pricked out into boxes or pans prepared in the same way as seed boxes, but slightly rougher in texture. Great care must be taken in the handling of the prothallus, as it is extremely tender, and is liable to die if subjected to the least bruise. The death of one affects others.

Soon after this, they should be potted up into small pots, using a compost of leaf-mould, peat, plenty of sharp sand, and a little loam.

All should be left in a warm house till they are taking root in the pots, when they may be hardened off (if a hardy species).

Spring and summer are the best times of the year for the operation, but it may be done successfully at any season.—*Canadian Florist*.

SOME NEW SHRUBS FOR NORTHERN GARDENS

The plants in this list are hardy in southern New England and the middle states. The two *Rhododendrons*, however, cannot be grown in soil impregnated with lime. Several of these plants cannot, unfortunately, be found in American nurseries; they are, however, easily propagated and a demand for them will in time produce a supply. The list contains the names of eighteen of "the best" new shrubs; it might easily be increased to a hundred, for there is a large number of new or little known shrubs now growing in the Arboretum which American garden-makers unfortunately neglect. The plants selected today are: *Hammamelis mollis*, *Prinsepia sinensis*, *Corylopsis Gotoana*, *Amelanchier grandiflora*, *Forsythia intermedia spectabilis*, *Cotoneaster huphensis*, *C. racemiflora soongorica*, *C. nitens*, *C. multiflora calocarpa*, *Rosa Hugonis*, *Neillia sinensis*, *Rhododendron Schlippenbachii*, *R. japonicum*, *Berberis Vernæ*, *Syringa Sweginzowii*, *Spiræa Veitchii*, *Philadelphus purpurascens*, and *Euonymus planipes*.

Like the other Witch Hazels of eastern Asia, *Hammamelis mollis* blooms in the Winter and the flowers are not injured by the severe cold to which they are subjected in the Arboretum. This plant has handsome foliage and larger and more brightly colored flowers than the other Witch Hazels, and is invaluable for the decoration of Winter gardens. *Prinsepia sinensis* is considered here the best shrub the Arboretum has obtained from Manchuria. It is valuable for its perfect hardiness, the fact that its dark green leaves unfold before those of any other shrub in the Arboretum, with the exception of those of a few Willows, and for its innumerable clear yellow flowers which open before the leaves are fully grown. The stems of this shrub are armed with stout spines and it should make a good hedge plant. *Corylopsis*, which is an Asiatic genus related to the Witch Hazels, has handsome yellow, early Spring flowers in drooping clusters which appear before the leaves. There are several Japanese and Chinese species in the Arboretum but only the Japanese *C. Gotoana* has been uninjured here by the cold of recent years, and it is the only species which can be depended on to flower every year in a Massachusetts garden. The *Forsythia* of the list is still the handsomest of the varieties of *F. intermedia* which is the general name of the hybrids between *F. suspensa Fortunei* and *F. viridis*. This variety was raised in a German nursery and is the handsomest of all the *Forsythias* now known in gardens. *Amelanchier grandiflora* is believed to be a hybrid between the two arborescent species of the eastern United States. . . . *canadensis* and *A. laevis*, and is by far the handsomest of the *Amelanchiers* in the large Arboretum collection of these plants. It came here from Europe but what is believed to be the same hybrid has been found in several places in the eastern states. The four *Cotoneasters* in the list are perhaps the handsomest of the twenty odd species introduced by Wilson from western China. They are all large shrubs of graceful habit, and have white flowers and red fruits with the exception of *C. nitens* which has red flowers and black fruit. In recent years the Arboretum has made few more important introductions for American gardens than the Chinese *Cotoneasters*. Although no longer a "new plant" *Rosa Hugonis* is included in this list because it is not only the handsomest of the Roses discovered in China during the last quarter of a century, but in the judgment of many persons it is the most beautiful of all

Roses with single flowers. Fortunately for American garden-makers the value of this Rose is appreciated by a few American nurserymen from whom it can now be obtained. The introduction of *Neillia sinensis* made it possible to add to the Arboretum collection a representative of a genus of the Rose Family which had not before been cultivated in the Arboretum. There are now other species of *Neillia* grown here but some of them are not entirely hardy, and others have no particular value as garden plants. *Neillia sinensis*, however, has never been injured by cold, and with its drooping clusters of pink flowers is a handsome plant well worth a place in any garden. *Rhododendron (Azalea) Schlippenbachii* is one of the most important introductions of recent years. A native of northern Korea, it grows further north and in a colder country than any other Azalea, with the exception of the *Rhodora*, and there can be little doubt that it can be grown successfully in the open ground much further north in the eastern United States than any of the other Asiatic Azaleas. It may be expected, too, to prove hardy further north than the American species with the exception of *Rhodora*. The large pale pink flowers of this *Azalea*, although less showy than those of a few of the other species, are more delicately beautiful than those of any of the Azaleas which have proved hardy in the Arboretum. There are a few plants of this *Azalea* large enough to flower in the United States, and many seedlings have been raised here and in Europe during the last two years. Until these are large enough to flower it will probably remain extremely rare. *Rhododendron (Azalea) japonicum* cannot be called a new plant for it has been growing in the Arboretum since 1893, but it is such a valuable plant and is still so little known or understood that it can perhaps properly find a place in a list like this. The large orange or flame-colored flowers make it when in bloom one of the showiest of all the hardy Azaleas. *Berberis Vernæ* has been mentioned in a recent number of these Bulletins; and it is only necessary to repeat what has already been said about it, that it is a hardy plant of exceptionally graceful habit among Barberries, with arching and drooping branches from which hang innumerable slender clusters of small yellow flowers followed by small red fruits. *Berberis Vernæ* has proved the handsomest of the large number of Barberries with deciduous leaves found by Wilson in western China. Among the numerous species of Lilacs introduced into gardens from China during recent years *Syringa Sweginzowii* is considered the most beautiful by many persons. It is a tall shrub with slender erect stems which produce every year great quantities of pale rose-colored, fragrant flowers in long rather narrow cluster. It has the merit of being almost the last of the Lilacs in the Arboretum collection to bloom. *Spiræa Veitchii* has the merit, too, of being the last of the white-flowered *Spiræas* to flower. It is a shrub already 6 or 8 feet tall in the Arboretum, with numerous slender stems and gracefully arching branches which about the first of July are covered from end to end with broad flower-clusters raised on slender erect stems. This *Spiræa* is one of the best of the hardy shrubs discovered by Wilson in western China, and by many persons it is considered the handsomest of the genus as it is now represented in the Arboretum. *Euonymus planipes* is a native of northern Japan and a large shrub with large dark green leaves and the inconspicuous flowers of the genus; and it is only on account of the beauty of its fruit that this plant is included in this list, for the fruit which hangs gracefully on long slender stems is large, crimson, very lustrous and more showy than that of any of the other Burning Bushes in the Arboretum.—*Arnold Arboretum Bulletin*.

A Lesson on the Conservation of Plant Food in Soil

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

SO far as crop raising is concerned, the advent of September, or earlier, brings a cessation from seed sowing out of doors in the more northern parts of the country; but it does not, or should not, bring about a cessation from gardening.

Each season of the year has its own special work which is of the utmost importance at that time, but there is no period of greater importance than the Autumn because the effects of what is done, or left undone, then are felt for good or evil throughout the entire following year.

There are far too many garden owners, both large and small, who think that when the cropping season is over there is little or nothing to do in a garden until the following Spring. This idea is a complete fallacy, and all real gardeners find themselves just as busy during the Autumn as in the Spring. One cannot put too much emphasis upon the great benefits connected with making every possible use of the Fall season. There are many things which can be better done then than at any other time; there are other things which must be done then or they cannot be done at all; and the Autumn is the best time to carry out all kinds of permanent planting and other improvements or extensions.

From the point of view of economy and of continually increasing permanent soil fertility the conservation of plant food is at this season of great importance.

A properly cared for vegetable garden—and it is to this department which our remarks now mainly refer—will have been kept free from weeds and the ground between the plants religiously cultivated throughout the season. This cultivation not only prevents the existence of weeds and renders watering less necessary, but the continual stirring of the ground greatly assists in bringing the plant food which the soil may contain into an available condition.

Like all other living organisms, plants require for their sustenance food containing several ingredients, but unless some proportion of all these ingredients exists in the soil in a proper condition for the plant to make use of they might just as well not be there at all. The great difference between the available and the unavailable plant food of a soil is the reason for the fact that a chemical analysis of a soil gives no criterion of its fertility, although such analysis may give some idea of a soil's potentialities in that direction.

Not only do plants require several different food elements for their growth but these elements are required in certain proportions and excess of one or more will not compensate for deficiency in others. Every species of plant has practically the same composition wherever it may be grown, and from this we know how much of any element a crop of a given weight will remove from a given area of ground. For example a medium crop (150 bushels) of potatoes removes twenty pounds of phosphoric acid from an acre, but as plant roots do not come into contact with all the soil it follows that there must be considerably more than twenty pounds of phosphoric acid available in an acre to enable this amount of potatoes to be produced. It has been estimated that there must be four times the quantity of plant food in an available state than is used to produce a crop of a given bulk; therefore when a crop is removed there is always a considerable quantity of plant food in an available state remaining in the soil. It also follows as a matter of course that the larger the crop the larger is the amount of available plant food remaining unused.

If the ground is allowed to remain bare with nothing growing upon it then undoubtedly the greater part of this unused available plant food is wasted by being washed down into the subsoil by Autumn rains, the waste being greatest upon a sandy soil and least upon one of a clayey nature. Further, available nitrogen is lost with much greater ease than other food ingredients. In this connection Dr. Russell, of the Rothamsted Experimental Station, has carried out some epoch-making experiments concerning the loss of nitrogen in drainage water. As the results of his investigations, he found that from September 13 to February 15, the richest soil lost the equivalent of 504 pounds of nitrate of soda per acre, and the poorest lost the equivalent of 168 pounds of nitrate of soda per acre; this makes the average loss to be practically fifteen dollars per acre in nitrogen alone.

Good treatment of the soil not only benefits the crop growing

upon it at the time but also may be of considerable advantage to the crop of the following year. How great this advantage may be will depend upon whether the garden is totally neglected, or the reverse, after the crop-growing season is over.

One of the most important features of Autumn gardening is the using up of the plant food remaining unconsumed and preventing it from being lost, and it is this which the growing of cover crops accomplishes.

In this connection a large-scale experiment was carried out in Britain during 1916-1917 by Professor Wibberley on a field of eight acres. During the Summer of 1916 the entire field was under the same crop. At the end of Summer part was sown to a green crop and the remainder left uncropped. The green crop was eaten off by sheep during March and early April. Immediately after, the entire field was manured and cultivated uniformly throughout and planted at the same time with the same variety of potatoes. The crops at the end of the experiment were carefully weighed, with the result that the portion under cover-crop gave 360 bushels per acre and the portion uncropped 263 bushels per acre. A very striking illustration of the waste which goes on when land is left uncropped during Autumn; and in all cases the more open the Winter and the later the soil freezes up the greater the waste.

Another feature of importance in connection with Winter cover-crops, especially in wet Winters when the ground is not frozen up for long at a time, is that these crops, owing to leaf evaporation and root action, help to dry the land in readiness for preparing it for the succeeding Spring crop.

Seed for the production of a cover-crop should be sown upon all ground immediately after a crop for use is finished and there is no further time for another one to mature for that purpose. If there is only a narrow strip vacant it should be sown, followed from time to time by other strips until the entire vacant ground in the garden is covered. Sowing broadcast is the best method so that all the soil is evenly covered.

In deciding what species of plants should be sown for a cover-crop we must bear in mind what we wish to accomplish and what is possible to attain by it; having regard also to climatic conditions as to whether the crop is wanted to live through the Winter and make some Spring growth or whether it is intended to turn it under before the ground becomes frozen up.

First we want to use up the available nitrogen, phosphates and potash remaining in the soil, and we can at the same time also add nitrogen to the soil by the use of some kind of leguminous plant. For the latter purpose Crimson Clover will answer for sowing during August and September; subsequently Winter Vetch can be used. As these and other leguminous plants obtain their nitrogen from the atmosphere, and are termed nitrogen gatherers, it is doubtful if they make any use whatever of available soil nitrogen. To conserve the latter some plant which is a user of soil nitrogen, such as rye, should be sown at the same time. Buckwheat and rape are also good to mix in as they are good foragers and their root action is such that there will be little available plant food escape them.

The value of the rye and vetch combination for late sowing as a soil renovator is very great, especially upon light soils. The Winter vetch will frequently grow where other legumes will not and as a nitrogen gatherer it is at least equal to any others of its family. It has the further qualification of being extremely hardy and succeeding in the more northern parts of the country. The vetch may, as above noted, be sown later in the Autumn than the clover and will furnish a greater quantity of matter for the production of humus after being turned under in the Spring than anything else, but the crimson clover combination is preferable for early Fall sowing as it makes more growth before Winter. During the Autumn the vetch appears to spend its energies in making root growth rather than top and is frequently scarcely visible when Winter sets in. While the clover is often Winter killed it grows more or less rapidly during the Fall.

For the earliest Spring sowings the first planted cover-crops should be deeply spaded under just before hard frost prevents the operation being carried out so that the vegetable matter of the cover crop may have time to decay, and under ordinary conditions this portion of the ground will not require spading

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Departments of Foreign Exchange and Book Reviews

WOMEN IN HORTICULTURE.

(Continued from July issue)

The different occupations open to women in horticulture can be classified in the following categories:

I. **PRIVATE ESTATES.** There have always been a certain number of women employed upon private estates, and it is probable that this condition will continue in the future. While, in certain cases, woman has been employed by preference, according to her individual capacities, in other cases the proprietors, belonging themselves to the sex preferred to have, among the persons surrounding them, an educated woman as the chief gardener. It will be indispensable for the woman in this walk in life, to be an enthusiast in her work, for her life will often be very solitary, and she will have constantly before her a work that is hard and absorbing. This existence would be even unendurable without the compensation experienced by all true lovers of gardening in the practise of their occupation.

II. **HORTICULTURAL ESTABLISHMENTS OR NURSERIES.** Here again we find ourselves in the presence of a branch of horticulture in which a limited number of women can be employed. Although, for the reasons already indicated, the bulk of the work of these establishments will always devolve upon the male sex, the man of middling strength being capable of accomplishing a superior amount of labor, and being certain, by this fact, of being employed in preference to the woman in the majority of cases, it occurs often, nevertheless, that she gives proof of special aptitudes for certain works, especially those of them that concern the numerous manipulations relating to the multiplication of plants. She learns quickly, in general, and is clever as well as careful in her work. It is clear that if woman is going to attain to any consequence in these kinds of occupation it will be necessary for her to bring all her attention to bear and not to spare any effort to perfect herself in the practise of the operations; for those will succeed in this specialty who will show themselves superior to the man of ordinary skill.

III. **SCIENTIFIC EMPLOYMENTS.** The majority of women engaged in horticulture have been recruited among educated women, and have thus acquired their initiation into horticulture in the scientific atmosphere of a school, or horticultural college. It is then not strange that many of them have been sufficiently equipped, on the intellectual side of research work, to perfect themselves in it, and to occupy consequently positions permitting them to put to advantage the knowledge thus acquired. Occupations of this kind have become greatly generalized during recent years; they represent a vast field for action for women having love for the work and possessing sufficient experience. These occupations can be grouped in the following manner:

A. *Professors in schools and colleges of horticulture.* The number of feminine professors has always been inferior to the needs in this specialty. The principal cause resides in the fact that no special course has yet been provided for students desirous of devoting themselves to this professorship. Those who, in association with instruction in botany and the natural sciences, desire to attain to the position of professor of horticulture, in our days are obliged to pursue the ordinary course in a school of horticulture and then to complete these studies in a university. This represents long years of toil, and very few have the means to undertake such a task. It would be possible considerably to abridge the duration of these studies by the creation, in horticultural schools already giving practical instruction sufficient in all branches of the profession, special courses having for their end the preparation of future professors and their perfecting in the important theoretical subjects connected with gardening. Actually the majority of professors of botany in schools for girls have received their theoretical instruction in a college, generally situated in the midst of a town, where there is no real facility for acquiring a practical acquaintance with living plants. It would be quite preferable for these women that they should be able to do their studies in an institution where they would have the possibility of having theoretical courses associated with experience and with demonstrations executed in a practical manner in the open air. The assembled professors would then at the same time be able to give an entirely new orientation to botanical instruction and be able to call forth, among their pupils, a taste for gardening and an understanding of it, if desirable, and for work in the fields.

B. *Instructors and inspectors of horticulture.* The educational value of gardening in the rural schools is, in our day, gen-

erally admitted and in order to develop it many county councils have created positions of instructors and inspectors of horticulture. The occupations of persons occupying these positions vary according to them; nevertheless there is demanded of them in general instruction in schools of gardening, the keeping in touch with primary schools, the giving of aid and advice in all matters touching on their subjects, and the organizing of numerous courses and conferences for adults. Many women have already been invested with these employments and there is no reason to forbid the belief that many others have marked out for themselves this walk in life. It will, however, be necessary for them to possess extensive practical knowledge of horticulture as well as perfect acquaintance with the scientific principles upon which this profession fundamentally rests.

C. *Scientific research.* There exists, finally, a possible future for women in the scientific work and research of horticulture. Those who already possess sufficient experience and who show a special taste for certain problems of science such as the reproduction of plants, vegetable pathology and physiology, etc., will not have any difficulty in finding in the profession a field of action relating to the investigation of these subjects. It is necessary to notice that these researches require a high degree of knowledge; their adepts will have to be botanists and experienced chemists and possess in addition enough practical instruction in horticulture. The woman who has within her the requisite adaptation and who at the same time possesses the means for undertaking the necessary studies ought to succeed in this career.

There remains finally a question that deserves to be considered, it is that of the type of woman having the most chance of success in the practice of gardening. Before the war the women engaged in horticulture were drawn almost entirely from the educated classes. This came from the fact that the necessary apprenticeship could be found only in a college or in a school of horticulture and from the fact that this was hardly accessible except to those possessing sufficient pecuniary means. The horticultural colleges have since been obliged to direct an important part of their course toward instruction in the elementary operations of gardening. This practical acquaintance became then much more widely open to the students and those just entering upon the occupation and without any supplementary expense to them.

The war, however, has brought new conditions which have had a twofold influence upon the entrance of women into horticulture.

In the first place it has opened to them the gates of numerous gardens, where it is possible for them to accomplish their initial practical apprenticeship without having to pass through the different schools and colleges. It must be hoped that this new situation will have its reflex influence in the future upon the schools of gardening, and will give them the occasion to raise the common level of studies, while directing their instruction toward ends more modern and more specialized.

In the second place the exigencies of the war have produced a new type of feminine worker in horticulture; numerous young girls belonging to the laboring classes were drawn toward the "army of the land" and induced by the advantages of life in the open air. A certain number among them have maintained their employments of that time and are still employed in the private gardens and horticultural establishments. These women will some day perhaps experience a desire to study the scientific principles upon which rest the manual operations which they have had to execute. If this case occurs it can be resolved in two ways. By the organization of appropriate courses in the institutions of applied agriculture; 2. By the creation of fellowships and of bourses for certain designated schools of horticulture; these advantages being accorded only to women engaged in their profession after a certain time and not possessing the pecuniary means sufficient to pursue their studies to advantage.—*Translated from Revue Horticole.*

WATERING AND FEEDING PLANTS IN POTS

PLANTS grown in pots, particularly those in house windows, often die either through lack of sufficient moisture at the roots or are "killed with kindness" through watering them, not wisely, but too well. It is obvious that a general rule cannot be laid down for all and sundry plants, as they differ in their needs. Take the case of Azaleas, purchased often when in bloom; these in many instances do not live very long, and die off in a manner

unaccountable to the owner, but when facts are elicited the solution of the problem is not difficult—they die from want of moisture at the roots. Azaleas are potted for the most part in peat, and when they are watered, unless it is done thoroughly, little, if any, moisture percolates to the ball of roots, and through lack of this a shrinkage soon takes place, leaves drop off, and a general collapse follows. On the other hand, ferns of a delicate nature, which have been grown for market in a house where the air is charged with moisture, when they are removed to new environments which are drier are frequently given too much water at the roots. Plants in a sunny window need to be watched, and subjects like Heliotropes, Fuchsias, and Zonal Pelargoniums watered with discrimination. The golden rule of the "happy medium" is the best guide one can follow in watering plants in pots.

STIMULANTS.—When pots are full of roots a period arrives when it is seen that the plants need something more than clear water. It is then when a weak stimulant is beneficial, but no stimulant should be applied as a substitute for the usual water. Stimulants ought not to be given plants in a dry condition. As everyone knows, there are many concentrated manures on the market that, administered according to directions, are safe and do for plants what it is claimed they will but the virtue of old soot ought not to be overlooked.—*Garden Illustrated*.

SOME EFFECTS OF DROUGHT UPON EVERGREENS

For a long time I had been puzzled by what appeared to be the ravages of some caterpillar among *Rhododendron* and other evergreens. The leaves appeared to have had holes punched out of them either at the edges or between the latter and the midrib. Many experts declared these clean-cut bites to be the work of caterpillars, but no creature of that description could I ever discover either by night or day. Then my doubt of the caterpillar theory was strengthened when the discovery was made that the leaves of a *Camellia Donckelaeri* (in the open) were being treated in the same way. Earwigs and woodlice were suspected, of course, but I could never find either one or the other. I believe the fundamental cause to be drought, not necessarily root dryness alone, but excessive leaf evaporation. The shrub, feeling that it is subjected to more dryness than it can comfortably withstand, cuts out some of its leaf areas, and by so doing endeavors to check evaporation and so restore that nice adjustment which must exist between absorption and respiration in the economic well being of a healthy shrub. It is well known how *Rhododendrons*, especially some Himalayans, droop their leaves when subjected to a parching east wind so as to retard evaporation. Here on my dry bank, I have noticed that these shrubs not only part with portions of their leafage, so as to give what remains a better chance of survival, but they often form lines of cork cells parallel to the midrib of the leaves. This causes the latter to curl inwards, as well as to droop, and it seems probable that this action is but a phase of the same phenomenon, another style in self-preservation.

These facts and assumptions naturally open a wide field for thought on the subject of evaporation in evergreens, and I cannot help thinking that it is one to which the average gardener pays insufficient attention, more especially as regards newly planted shrubs. Why, for instance, do Hollies so often die if planted in Winter? Because the evaporation at their leaf pores is greater than their powers of absorption. Yet by cutting back that Holly—if you catch it at the right time—it will often break out. This because you have disposed of the leaf surface which was exhausting the plant and at the same time conserved and stimulated sap energy by concentrating it to a given limited area instead of allowing it to be dissipated feebly over the whole of the branches. It is the same with many conifers which, because they cannot be cut back, are, or should be, planted in Spring, when they are just breaking into activity and conditions are most genial.

There are evergreens, notably *Ekeagnuses*, many *Ericas*, conifers and some *Kalmias*, which, when just planted, will endeavor to rectify matters by dropping a number of their leaves while perfectly green, this again, one may presume, being but another mode of that self-preservation above mentioned. But the Holly cannot part with its leaves nor the Broom with its branches which serve as leaves, hence their slow and miserable death unless the surgical knife of the gardener comes to their aid. If these hard-leaved evergreens were able to drop their foliage when transplanted or during hot sunshine, with the cunning of a Cabbage all might be well. But too often they are helpless. With no means of checking the evaporation which is gradually destroying them, with no damp "ball of soil" to balance that dissipation, they are in most instances bound to succumb.

Of course, we know what the moral of all this is, *viz.*, "a good ball of soil," frequent waterings in Summer, and so on. But I rather think that if the average amateur were to realize the why and the wherefore of these things he might often avoid disappointment and loss.—*The Garden*.

LIME AND THE BEARDED IRIS

At the Iris Conference points relating to the successful cultivation of the Bearded Irises came under discussion. It is well known that lime is essential to the well-being of these Irises. Practically all the species are found growing on limestone formations. It was pointed out that the bacteria which are responsible for the rot disease of the rhizomes multiply amazingly in lime and consequently if there is evidence of this trouble ordinary lime should not be supplied to the surface of the beds. Superphosphate of lime, on the other hand, is fatal to these bacteria, and a top-dressing will generally stop the mischief. If the plants are badly attacked it is recommended that they should be taken up, all the affected parts cut right away the cut portions being rubbed with superphosphate, and the plants given a fresh site. Irises will not flourish in a waterlogged position. If the soil is heavy the beds should be elevated above the normal level or even thrown up in banks so that efficient drainage is secured. The best time for planting is shortly after flowering, July perhaps being the safest month, as new roots are then being emitted. The plants are thus able to take firm hold of their new quarters before Winter.—*The Garden*.

COLLARETTE DAHLIAS FROM AN AMATEUR'S POINT OF VIEW

My experience as an amateur grower of Collarette varieties may be useful to others. Having grown all types of the flower with the exception of the giant Paeony-flowered varieties, which I consider only useful for mixing with shrubs and such-like tall flowering plants, I have come to the conclusion that, for the grower with limited space, there is no type which will give greater satisfaction than the Collarette section. I have grown Cactus, Single, Pompon and Star Dahlias by the side of these, but without exception visitors have voted the Collarette the best. A vase of these Dahlias with varied tints is much to be preferred to the Cactus varieties, which are in bloom for a few weeks, giving exhibition flowers and afterwards producing undersized, misshapen flowers.

In diversity of coloring and formation the Collarette Dahlia is pre-eminent. Thin the foliage well, and blooms may be cut, as I have done until well into October, the plants at all times being well covered with flowers. For garden decoration, do not disbud the flowers, but allow them to develop naturally without allowing too much leaf and stem growth. The plan I adopt is to shield the plants from the cold north-east winds, and I also erect a screen to tone down the mid-day sun, as I find this is liable to bleach the red tints and also causes more work with the water-can. In order to do this I grow a row of runner Beans on the south side, and am fortunate in having a tall Privet hedge to break the wind. I only allow a space of three feet between each plant, and place stakes in readiness a month before the plants are set out.—*The Gardeners' Chronicle* (British).

CONSERVATION OF PLANT FOOD IN THE SOIL

(Continued from page 677)

again in the Spring. There is practically no loss of plant food in frozen ground even if it is bare. The portion spaded under in the Spring should be used for the later sowings.

In addition to using up available plant food and gathering nitrogen, cover crops when spaded in and decomposed increase the organic matter of the soil and to that extent only, take the place of stable manure.

From what has been said it will be obvious that after a cover-crop has been grown the amount of available plant food existing in the soil is less, as being taken up by the crop it now exists in a state of unavailability and is not therefore subject to the action of leaching. This condition, however, is only temporary as when the crop has become decomposed and turned into humus the plant food again becomes available.

Altogether, therefore, the spading into the soil of green crops is in many directions of great value, and this, otherwise known as "green manuring" is the cheapest and quickest method of changing a poor soil into a rich one, and the process may be carried out during any part of the growing season. If one has a poor, thin soil it will pay to use some additional plant food before sowing the cover-crop, for which purpose sheep manure will be satisfactory. Should the soil require lime, it and bone meal may be raked in with the seed, in the latter case the sheep manure should be omitted. The addition of these fertilizers will cause the cover crop to grow quicker and more bulky.

In connection with ground which has been cropped and cultivated during the Summer, spading is not necessary to prepare the soil for a cover crop, in fact it is undesirable as the top few inches is invariably the richest especially in nitrogen and spading would bury this out of the reach of the cover crop, especially during its early stages and would also facilitate the leaching of available plant food into the subsoil. All that is necessary is to loosen up the soil well with a hoe.

National Association of Gardeners

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1921 CONVENTION NEW YORK OCTOBER 11 to 14

The convention committee will publish the complete program in the September issue of the business to come before the meetings and of the entertainment in store for the visiting members.

The tenth anniversary of the association, under its charter, will be made a memorable event and every member that can possibly do so should come to New York to participate in this celebration. You are assured of instructive and enjoyable entertainment.

NASSAU COUNTY, N. Y., BRANCH ORGANIZED

The members of the National Association of Gardeners, who occupy the positions of superintendents and gardeners on the country estates located in Nassau County, Long Island, met at the Nassau County Club House, Glen Cove, Thursday afternoon, July 28, and organized as the Nassau County branch of the national association.

It was explained at the meeting by M. C. Ebel, Secretary of the National Association of Gardeners, that the purpose for establishing this branch is to create greater co-operation on the part of the local members of the national association, to protect their interests and those of their employers against the encroachments of the so-called "experts" who offer their services, ranging from an "advisory capacity" to that of "non-resident supervising manager" of an estate.

He stated that it has been his experience that most of these so-called "experts" possess a very limited knowledge of horticulture, their learning being confined to one or two phases of it,

and that primarily theoretical, but this does not deter some of them from assuming complete control over an estate if the opportunity comes to them, sometimes superseding a superintendent who has forgotten more than the "expert" ever learned about gardening. This, of course, is humiliating to a gardener who has conscientiously, and apparently satisfactorily to his employer, performed the duties of his position up to the time the "expert" made his appearance. The circumstance is not in any way mitigated when the "expert" places a man on the estate whose record is a failure wherever he has been directly engaged as a gardener, to instruct the gardener in charge what to do, and supervise the work, because the "expert" himself does not happen to possess the ability to give the instructions. Nevertheless he accepts a fee on the pretense that he is thoroughly qualified to direct and supervise what he has undertaken to do.

Mr. Ebel further remarked that no sensible gardener would hesitate to co-operate with a reputable landscape architect in the developing or maintenance of an estate, and that one seldom hears of a member of that branch of the profession attempting to force a superintendent or gardener out of a position in order to install himself. He blamed the gardeners for the foothold some of these "experts" have secured and urged that the gardeners endeavor to gain more confidence among their employers so that the employer will consult more freely with them and rely on them in the upkeep of their estates.

A general discussion ensued which was participated in by James Duthie, John F. Johnston, Alexander Michie, Thomas Twigg, John R. McCulloch, Alfred H. Walkers and others. It was the unanimous sense of those present that some action should be taken to acquaint the estate owners with the practice of some of the so-called "experts" who do not hesitate to resort to unscrupulous methods to establish a prestige.

Publicity was decided the best means to bring to the attention of their employers what the members are striving to accomplish to raise the standard of the profession.

The members of the branch went on record as opposed to the sign board nuisance along the highways and will co-operate with the national association in its campaign to arouse public sentiment against the practice of erecting sign boards that deface the natural science beauties along the countryside.

J. W. Everitt of Glen Cove, was elected chairman, and John R. McCulloch of Oyster Bay, secretary of the branch. Regular meetings will be held quarterly with special meetings at the call of the chairman whenever occasion arises to bring the members together.

The interest of the employers will be sought in the aims of the branch. The sustaining membership of the National Association of Gardeners already includes some of the prominent estate owners of Nassau County, among whom are, W. R. Coe, Paul D. Cravath, Mrs. David Dows, Mrs. Coleman du Pont, Childs Frick, Daniel Guggenheim, Mrs. W. D. Guthrie, T. A. Havemeyer, C. O. Iselin, Otto H. Kahn, W. Eugene Kimball, J. Pierpont Morgan, Mrs. J. Pierpont Morgan, Mrs. Harold I. Pratt, John T. Pratt, Charles A. Sherman, Benjamin Stern, Mrs. W. Stursberg, Daniel Tatum, Mrs. Payne Whitney.

NEW MEMBERS

The following new members have been added to the association recently: Lewis La Shire, Richmond Hill, N. Y.; Anthony B. Marum, Brooklyn, N. Y.; Thomas Mahan, Mt. Kisco, N. Y.; Dyson F. DeLap, Pocantico Hills, N. Y.; George Kury, Downers Grove, Ill.; James MacDougall, Morris Plains, N. J.; Christian Hansen, Brooklyn, N. Y.; Ernest Walter, West Orange, N. J.; Archie Andrews, Oyster Bay, L. I.; Joe Boehler, Locust Valley, L. I.; Donald MacGillivray, Tenafly, N. J.; David McKenzie, Crestwood, N. Y.

AMONG THE GARDENERS

Robert Marshall secured the position of superintendent of the L. Luckenbach estate, Elmcourt, Port Washington, L. I.

J. C. Taylor accepted the position of superintendent of grounds and greenhouses of The Broadmoor, Colorado Springs, Colo.

Robert Jeffrey secured the position of superintendent on the C. O. Iselin Estate, Glen Head, L. I.

Thomas Wilson secured the position of gardener to Wm. Milne, Rye, N. Y.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD HORT. SOCIETY

Owing to the excessive heat which prevailed on the meeting night of the above society business was made as light as possible. The principal subject discussed was the Autumn Dahlia Show to be held on Sept. 21st-22nd at New Rochelle.

Chairman Troy, of the Show committee spoke most encouragingly of the progress already made. Several thousand dollars are already in the hands of the officials and every effort is being made to make the affair a huge financial success. The New Rochelle Chamber of Commerce is taking an active interest in the show, several of its members being present to tell how they were assisting us in various directions. Mrs. Delancey Kane is chairman of one of the co-operating committees which is securing an influential body of supporters and garden clubs from both counties will take an active part.

There is even indication that the show will be one of the largest and most attractive to be held this Fall. The thorough business-like manner in which Mr. Troy and his committee are covering every detail assures the most successful show in the history of this Society.

GEORGE HEWITT, Cor. Sec.

SEWICKLEY, PA., HORT. SOCIETY

The regular monthly meeting was held on Tuesday evening, July 12th, with John Carman presiding. John Barnet won the monthly prize in the gardeners' classes, and Miss Christy for the third consecutive time won that of the amateurs.

The annual picnic came up for considerable discussion, and it was decided to hold it on Wednesday, August 24th. The arrangements are in the hands of the executive committee under the chairmanship of Richard Boxel, and a fine programme is assured.

A letter was read from Mr. Robt. P. Brydon, Supt. of "Glenallen" Cleveland Heights, Ohio, with reference to a contemplated visit of the Cleveland Horticultural Society to Sewickley, sometime in September. Arrangements will be made by the local boys to entertain them, and show them around the estates of Sewickley and vicinity.

H. Y. GIBSON, Asst. Secty.

ST. LOUIS ASSOCIATION OF GARDENERS

The August meeting was held on August 7th at the country estate of T. Porter Tirrell, Esq., Clayton, Mo.

President G. H. Pring called the meeting to order, and after the usual business was disposed of called on John Noyes, the designer of the grounds of the estate, who responded by the exhibition and explanation of the plans prepared for its development. The estate comprises about thirty acres of land of a varied topography which is being developed in an estate of unusual interest, including long distance prospects, formal gardens and well designed and located residence and group of service buildings. Mr. Baumgaertner, the gardener of the estate, explained the method of transplanting a number of large trees and the care of the newly established plantations.

L. P. JENSEN, Cor. Secy.

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Golden Spur. A popular trumpet variety for outdoors or early forcing. Entire flower is deep golden yellow. Double Nosed Bulbs	.90	7.50	Silver or Sulphur Phoenix (Cod-lins and Cream.) Large flower of double white with a sulphur center	.70	5.50
Barrii conspicuous. Large single variety. Perianth soft yellow, cup yellow with bright scarlet edge	.65	5.00	Von Sion (Double Yellow Daffodil). Strikingly beautiful large double yellow flowers. Fine for forcing	.90	7.50
Incomparabilis Sir Watkin (Giant Welsh Daffodil). Very large flowers. Primrose perianth with golden crown, tinged orange scarlet. Double Nosed Bulbs....	.90	7.50	Special collections of the above 10 Daffodils.		
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Here and There

FLOWERS ATTRACTIVE TO BUTTERFLIES

The Rev. Joseph Jacob, in writing upon his trial of some of the newer Aldenham Michaelmas Daisies, made the happy discovery that they stand high in the list of flowers attractive to butterflies. This pleasing attribute in a flower is generally completely overlooked so far as butterflies are concerned, though not so as regards bees, which do have their wants catered to in some

flower catalogs and, no doubt, in some gardens. Indeed, on reflection, is there not a much added enjoyment to a border of flowers in full sunshine when it is vocal and vibrant from the busy company of happy insects at work among the flowers? I suppose it is that a feeling of companionship comes over one, as sharing a pleasure with others. Some years ago I tried a series of experiments on naturalizing not only some of the showier butterflies but moths also. I tried obtaining eggs and transferring the resultant caterpillars to their natural food plants, and also releasing the perfect insects that had been bred in captivity. My experiments were limited to the showier

British species, but all, I must confess, resulted in failure. After this, the only course open to me seemed to be to plant freely of flowers most attractive to butterflies, and in this way better results were obtained. Far and away the most attractive plant to these insects is *Sedum spectabile*, which does not, however, bloom till the month of August. At that time in bright weather the several showy species of the genus *Atalanta* may be seen hovering over the large flattened heads of pink flowers, and imbibing the nectar until they became partially stupefied. This will happen even if before the flowering of the *Sedum* scarcely a butterfly of this section is to be seen. A shrub nearly as attractive to the same butterflies is *Itea virginica*, a native of North America, which forms a compact, freely branched bush, as a rule from 3 to 5 feet in height. The flowers are small, whitish, and disposed in dense spikes a good deal in the way of some of the shrubby Veronicas. It needs a cool, moist peaty soil. Other subjects that may be mentioned as very attractive to the showier butterflies are single Dahlias, Scabious, Sun-flowers, Marigolds and the British Ragwort.

—The Garden.

EDUCATIONAL VALUE OF SCHOOL GARDENS

"It seems to me that the leading American school gardens have always been of general educational value along Nature-study lines," says Maurice A. Bigelow, director of school of practical arts, Teachers' College, New York. "They have made the children interested in useful plants; they have led to aesthetic appreciation of plants; they have a glimpse of the relation of plants to human life; they have given training in observing Nature for the joy of learning fact. In short, the typical American garden has been a most successful Nature-study laboratory. I believe that we have learned from experience that the garden for children is to be regarded primarily as an educational apparatus, just as books and maps and blackboards are materials for use in instruction. As I look over the educational good that has come irregularly and uncertainly from the children's garden of the past, I have vision of gardens of the reconstructed or readjusted future which will give constant and certain contributions to the making of good citizens."—*The Christian Science Monitor*, July 22, 1921.

TREES AND SHRUBS WITH BRIGHT-COLORED STEMS

Although the numerous hardy trees and shrubs lose a great deal of their interest after the fall of their leaves there are several which present the most picturesque aspect when destitute of foliage, for then the bright colored bark is disclosed.

Amongst large-growing trees many pleasant features may be recalled. The birches are especially conspicuous, for not one can have failed to note the silvery trunks of the common birch, as seen everywhere throughout the country, though he may have missed the equally silvery trunks of several American and Japanese kinds. As a contrast to the white-barked birches we have *B. nigra*, the red birch of North America, the reddish bark of this species being very noticeable. Though less bright than the bark of the birch the bark of the beech also is conspicuous in Winter, for when clean it has a grayish hue.

It is, however, amongst shrubs that the brightest color is noticed. The *vitellina* forms of *Salix alba*, for instance, are not-



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able for bright red and yellow stems. It is possible to get some kinds to assume the proportions of moderate-sized trees, but the color of the branches is less bright than when the bushes are cut down each year and long annual shoots are depended upon. *Salix daphnoides* offers a contrast by reason of its purplish stems, which are coated with a glaucous bloom. Several kinds of *Cornus* are equally desirable shrubs, *C. alba* and its several varieties, *C. Baileyi* and *C. stolonifera* producing bright red bark, whilst the variety *flaviramea* has golden branches. *Leycesteria formosa* is conspicuous on account of its vivid green stems, and the various kinds of *Cytisus* and *Genista* and *Kerria japonica* are appreciated for the same reason. Browns are represented by *Forsythia suspensa*, *Philadelphus* in variety, particularly *P. Lemoinei*; the various kinds of *Neillia*, many *Spiraeas*, *Stephanandra flexuosa*, *Ribes sanguineum*, *Rubus spectabilis*, *R. odoratus*, *R. deliciosus*, *R. Nutkanus*, etc. Amongst Barberries, the most conspicuous are *Berberis cirescens*, with red branches, and *B. dictyophylla* and its variety *albicaulis* with white stems. The white-stemmed Bramble (*Rubus biflorus*) has long been known as a conspicuous shrub in Winter, for its strong branches have the appearance of having been coated with whitewash. Several other American kinds with white-coated stems, such as *R. leucodermis* and *R. occidentalis*, have also been long in cultivation, but we have now a number of other kinds from China which promise to be even more attractive. Amongst them there are *R. lasiostylus*, *R. Giraldianus*, *R. coreanus*, and *R. niveus*, in addition to several un-named kinds.

The beauty of many of these colored stemmed shrubs is most apparent when they are planted in large masses, and they should be so placed that they can be seen from a considerable distance, for on a sunny day the touches of color light up and relieve leafless plantations or sombre-hued groups of Conifers or other evergreens.—*Gardening Illustrated*.

PATH MARGINS.

There are nearly as many edging plants as there are bedding plants, but, while one sees many gay and original schemes in beds and herbaceous borders, one does not notice a proportionate variety of pretty margins. Heaths make a glorious and quite unique edging to a graveled path, while Thyme, either the common herb or the dwarf wild Thyme, is also charming. *Escholtzia* makes a gay fringe of orange and yellow to a bed, while Figwort, Woodruff, *Nasturtiums* (dwarf), common Musk, Snow-in-Summer, many of the Saxifrages, and the Bellflowers are guaranteed to give the duller border a gay margin.

I wonder why it is that, with a long list of these plants at our disposal, the edges of our borders are often lamentably dull. Box has the advantage of looking fresh all the year through, but it offers hospitality to various slugs and garden pests, which is, of course, a drawback. But then all live edgings have this drawback. The concrete border is not very beautiful in its infancy, but it can look very charming when properly covered. It is a boon in small gardens and a help to keeping the paths tidy. It can always be camouflaged by such drooping plants as *Aubrietia* or *Arabis* in the Spring, and Saxifrages in the Summer.

Rustic and brick edgings are never very pretty, save in country cottages, where they somehow fit in with their surroundings. Mignonette or Musk in the Summer, Saxifrage or *Aubrietia* in the Spring, *Lobelia* or *Nasturtiums* in the Autumn fit in with this scheme of edging. Another path margin which can be truly delightful is the rockery border to paths. Alpines are mostly success-

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ful. Pinks, Thrifts, and Rockfoils look charming, London Pride is ever so fascinating, and many of the annuals are also worthy of mention. Ferns make useful margin plants, and have the advantage of being evergreen and of being easily obtained. *Gardening Illustrated*.

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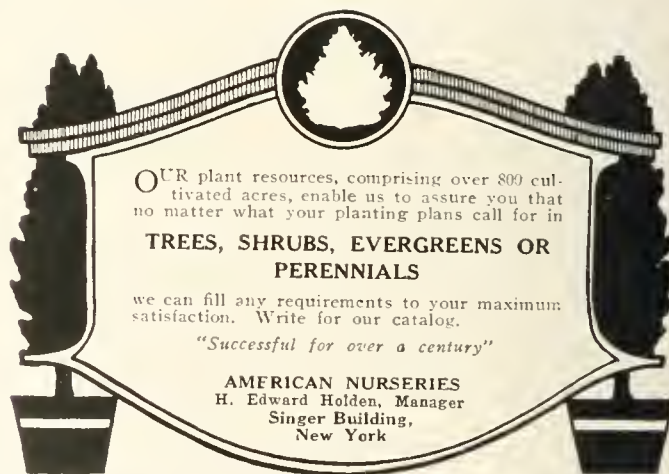
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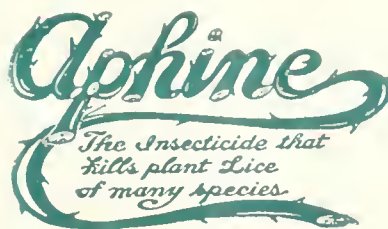
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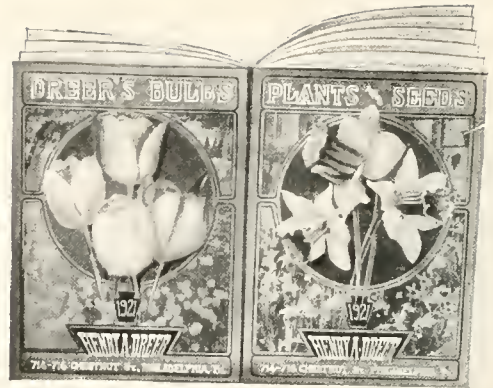
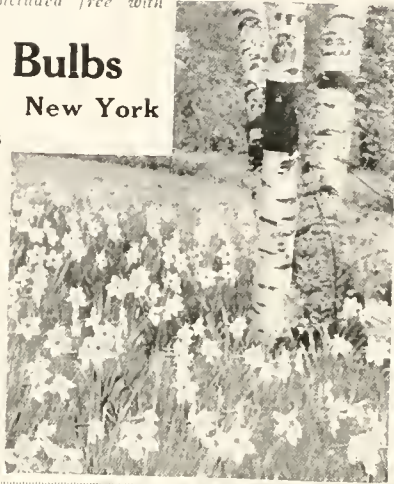
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

SEPTEMBER, 1921

No. 9

Things and Thoughts of the Garden

MONTAGUE FREE

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BOTANICAL
GARDEN

THE Englishman's predilection for the weather as a subject of conversation has probably never been more strikingly exemplified than this Summer, for the great drought is the all engrossing subject of conversation, especially amongst those who are interested in horticultural pursuits. In the London district only a fraction over two inches of rain fell between February 1st and the end of July and here in Cambridgeshire, normally the driest section of England, with an average rainfall of only about twenty-two inches a year, appearances indicate that precipitation has been even less.

The effect on gardens has, of course, been disastrous and this season one has had to use a great deal of imagination in order to realize the beauty and attractiveness of English gardens when at their best. Many rare plants have undoubtedly been lost as a result of the unparalleled dryness—a drought that has broken all official records and caused the "oldest inhabitant" to tax his memory in vain.

Conifers, and evergreens generally, seem to have been the worst sufferers and it has been painful for a garden lover to notice the woebegone appearance of *Rhododendrons* and similar plants. In many gardens in which large groupings of the various species of *Erica* were a feature, this Summer will be long remembered for the heaths are amongst the worst sufferers. It must be heartbreaking for the gardener to have to see specimen trees and plants dying for lack of water—a lack that he is unable to supply and one that is but seldom felt under the normally weeping skies of damp Albion.

Even in those gardens where there is an amplitude of help it has, in many cases, been impossible to utilize it in mitigating the severity of drought except by mulching; for the local authorities in most districts have prohibited the use of water except for necessities. The watering of plants, even rare ones, cannot be considered a necessity when the water supply is so low, that, in some country districts at least, it has to be brought in a water cart from a distance and peddled from door to door at the rate of sixpence a pailful.

The effect on the supply of vegetables is, of course, profound and they are scarce and the price almost prohibitive to those in poor circumstances.

* * * *

We have recently been visiting gardens in the Birmingham district, where they have had good rains after the prolonged drought, and it was interesting to note the effect on various crops. The behavior of mid-season and late potatoes was such as to cause much disquiet to

the growers. Instead of growing along normally, these potatoes appear to have stopped, and partially ripened, when the tubers were the size of walnuts or a little larger. The rains have caused these partially ripened tubers to start into growth and send out shoots in the same way as a newly planted set. This has caused much speculation as to the ultimate result, for the season is now so far advanced that there is but little chance of this new growth amounting to anything. Some gardeners are discussing the advisability of lifting the crop immediately, but this seems to be a counsel of despair for there is but little likelihood of late potatoes keeping over Winter if dug at this early stage.

Other effects of the belated rains are to be seen in the splitting of fruits, notably of Summer apples. Many shrubs such as *Rhododendron* and *Cephalotaxus* have put forth new shoots, and, should the coming Winter be a severe one, it is probable that this new growth will be severely injured.

* * * *

The ancient borough of Cambridge and its environs contains much of interest to the gardener, apart from any adventitious interest he may have in medieval architecture. In the town itself, first and foremost stands the University Botanic Garden, the repository of many rare and beautiful plants. Then there are the gardens of the various colleges with gay flower borders and window boxes toned down somewhat by their association with venerable and time stained walls. On the outskirts of the town are many private estates worthy of a visit and for pomologists, the great fruit farm of Chivers and Sons, the jam makers, is a place of pilgrimage.

From a combination of circumstances—the war, drought, and lack of funds—the Botanic Garden is to some extent a place whose glories have departed but there is still much that is worthy of admiration.

The former Curator, R. Irwin Lynch, V. M. H., was greatly interested in growing out-of-doors plants that are usually considered tender in this district and many of these are to be found in the borders surrounding the range of plant houses. Doubtless, in addition to the shelter from wind, heat radiated from the walls of these houses assisted in mitigating the severity of the Winters. In these sheltered bays may be found many plants that, even in England, are considered to be greenhouse subjects. The Transvaal Daisy, *Gerbera Jamesoni*, flourishes and blooms all Summer; *Thunbergia natalensis*, remarkable because of its upright habit, displays its lavender blue flowers; a hybrid *Bomarea* exhibits its clus-

ters of tubular flowers in profusion and there are fine plants of the olive, the caper, the loquat, and many species of *Opuntia* from Texas and Mexico that are usually considered to be tender. Here, too, may be seen such plants as *Camellia*, *Passiflora cærulea*, and *Amicia zygomeris*. It was in one of these bays that the handsome Bromeliad, *Puya chilensis*, was flowered out-of-doors. At the time of writing, however, it is but a wreck of its former self. In this part of the garden several species of *Crinum* are making a brave display, and several varieties of *Amaryllis Belladonna* are exhibiting their snowy flowers.

The only spot in the out-door garden where the plants seem to be really flourishing is the bog-garden, for here there is no lack of water. This beauty spot is secluded and occupies a basin-like depression. A pool in the center has around its edges a number of small islands which are easily accessible from the bank. These islands are raised only a few inches above water level and provide ideal conditions for plants that revel in wet feet but which will not grow satisfactorily when actually in water. Here one may gain a good idea of the decorative value of the California Saxifrage, *S. peltata*. This is a plant in great favor in England for stream and bog planting. We do not remember having seen it in N. E. America but it is a plant well worthy of attention and should endure our climate. It produces massive clumps of umbrella-like leaves with scalloped edges and bronze coloring on petioles two feet long. Its flowers are produced in early Spring before the leaves appear and although they are pleasing and welcome they are not particularly showy.

The entrance to the bog-garden affords a charming example of informal planting. A background is provided by a picturesque specimen of the California Redwood, *Sequoia sempervirens*, whilst the foreground is occupied by healthy clumps of Bamboo, Ostrich Fern, *Saxifraga peltata*, *Primula japonica*, *Dodecatheon*, and *Spiræas* of the moisture loving kinds.

While on the subject of plants that thrive only when in proximity to water mention must be made of the wonderful specimen of *Gunnera manicata* from Brazil that grows by the lakeside in this garden. There may be finer examples of this noble plant in cultivation but so far we have failed to see any. The clump under notice is from fifteen to twenty feet in diameter, the leaves attain a height of six feet, and in most cases the leaf blades are at least four feet in diameter. A gardener does not need to have a great imagination in order to realize the possibilities of a plant of this character in landscape composition.

The garden contains many wonderful specimen plants of shrubs and trees, as might be expected from a collection that was started in 1846. The guide book states that: "The trees and shrubs of this garden have been described by a great authority as a remarkable assemblage," a pronouncement that will be agreed with by any visitor who knows anything at all about the subject.

Near the entrance is a glorious bush of *Berberis stenophylla* fully twenty feet in diameter and nine feet high. This must be a gorgeous sight in Spring when smothered with its myriads of bright yellow flowers. It is a great pity that it is not hardy in the northern part of our country, for, although there are so many species of *Berberis* in cultivation (according to some far too many), there are dozens that we could dispense with for the sake of this gem. It stands shearing well and makes a fine impenetrable hedge as evidenced by the splendid example around the formal water garden at Kew.

Cambridge is proud and justifiably so, of a magnificent group of *Pterocarya fraxinifolia* (*P. caucasica*),

a handsome tree with pinnate leaves. It consists of a score or more trunks springing from a small area and arising to a height of over sixty feet. This forms a mass, rounded in outline and, viewed from a short distance, has the appearance of a single tree. Botanically it is related to *Juglans*, but its small, winged fruits disposed in chain-like racemes do not, to the layman, suggest any connection with the walnuts.

This garden has the honor of possessing the finest specimen in Britain of the N. American Pawpaw, *Asimina triloba*, which is over 14 feet high and over 16 feet through. Other North American plants that flourish here and are worthy of attention are several good specimens of the Big Tree, *Sequoia gigantea*, and a perfect specimen, forty feet in height, of a Mexican oak, *Quercus obtusata*.

The fairly extensive range of glass-houses contains many plants of interest both to the gardener and botanist, but space will not admit of any attempt to describe them. The arrangement of these houses is ideal from the point of view of convenience in the care of the plants. They are all connected to a corridor, a hundred yards long, on the north side of which are the potting sheds. Thus potting, etc., can be attended to without taking the plants into the open, whilst the corridor with its solid beds on either side provides splendid facilities for the cultivation of climbing plants which are trained on a trellis near the roof.

* * * *

As evidence of the hold that the cultivation of alpine has upon the English people it may be mentioned that of all the gardens we have visited not one has been found without its rock garden. In some cases, as at Aldenham House it is of relative unimportance, and in others as in R. A. Malby's backyard garden in London, it is the main feature of the establishment. We must try to find space in a future article to write more fully of this remarkable London garden, constructed on an area of 70 x 30 feet.

One of the most beautiful rock gardens we have seen, in its construction, planting, and harmony with its surroundings, is that at Childerly Hall, about eight miles from Cambridge.

The mansion is a red brick Elizabethan structure, of added interest because of the fact that King Charles was once imprisoned in one of its rooms. The terrace is laid out with formal beds which in this case do not call for notice; but on it there is a fine old, gnarled Laburnum tree which must be of great age; and a Tree Peony at least fifty years old. The steps leading down from the terrace are worthy of notice. Looking up from below there is first a short flight, flanked on either side with huge bushes of lavender. The interstices of the steps are planted with low growing plants such as Thyme, *Acena*, *Corydalis lutea*, etc. Then there is a landing with a sundial in the center, and on either side slightly raised semi-circular platforms for the support of garden seats. Here is to be seen a fine example of pavement planting—the combination of dwarf upright growing plants and trailers being in correct proportion to give a harmonious result in combination with the stone flagging and sundial. From this point looking towards the house we see another flight of steps, also planted, and the opening of the terrace wall bounded with red brick pillars which are mellowed by time and partially covered with ivy. In the distance is the quaint and ancient doorway of the mansion framed in climbing plants. The whole forms a picture that is both charming and restful.

To the left of the steps and reaching up to the terrace walls, which by the way is clothed with wall shrubs and

(Continued on page 701)

Leontopodium—Edelweiss

RICHARD ROTHE

ALL the species of the genus *Leontopodium*—Lion's Foot, are mountain denizens of high altitudes. Belonging to the large order, *Compositae*, they are tufted woolly perennial herbs producing handsome terminal flower heads enveloped in white woolly bracts. Cut and dried they possess the keeping qualities of immortelles and for this reason are frequently gathered and sold as souvenirs.



Leontopodium sibiricum

Best known is the Edelweiss, *Leontopodium alpinum*, syn. *Gnaphalium leontopodium*, in cultivation for over a century, but, as a garden inmate usually lacking the pure glistening white color in its flowers and changing its longevity from a perennial to the biennial. Fresh edelweiss seed grown under glass in light sandy soil during mid-Winter germinates quickly. Seedlings pricked over into flats early in March by the beginning of May are strong enough to be transferred to the open ground. Select a slightly slanting bed of sandy loam and omit manuring.

Throughout the Middle Atlantic States light shade during the early afternoon hours is of advantage, but avoid direct overhead shade as dripping rainwater from the foliage of overhanging trees proves fatal to Edelweiss plants. For states along our northern border line an entirely open and sunny situation is the best. Plants kept in thrifty growing condition flower more or less during the first season. When removing leontopodiums into open sunny rookeries add ground or crushed limestone to the soil and to prevent injury from hot weather select positions or rock-products slanting in northerly or easterly directions. Not being able to count on permanently frozen ground condition and a thick mantle of snow during Winter, we have to provide for protection. Thickness of the cover depends on latitude and climate of locations, but care should be taken to use a material allowing access of air to our edelweiss plants.

Since the introduction of the Siberian Lion's foot we have a species of *Leontopodium* more resistable and of stronger growth and larger flowers than the edelweiss of the European Alps. Our cut, a reproduction of a photo taken early in August, shows seedling plants started in February at the beginning of their flowering during the

first season. They bloom profusely the second season.

Leontopodium himalaicum is a late and much smaller flowering species from the Himalaya, while *Leontopodium japonicum*, syn. *Gnaphalium Sieboldianum* is distinguished by a dark glossy green surface of its foliage and loosely built cymes.

The flora within the regions of the Bavarian, Tyrolean and Swiss Alps is lavishly rich in beautifully flowering shrubs and herbs. Living a primitive and toilsome life the native people cannot reasonably be expected to appreciate floral beauty as the highly cultured tourist or garden and flower lover does. In their sentimental attitude toward the Edelweiss, however, they make an exception. In pointing out their deep reverential love for it I feel obliged to cite the text of one of their plain, simple folk lore songs, in its translation endeavoring to give as much as possible the exact meaning of the original.



Leontopodium alpinum Amid the Alps

EDELWEISS

Upon the mountain's steep and icy throne,
A starry flower, snow-white stands alone;
Amid the Alps, a solitary gem;
Noble and pure its fairy face and name;
The herds-boy loves it, knows it well;
The herds-boy loves it, knows it well;
Ask him and he will proudly tell;
It is the flower we treasure beyond price;
Queen of the Alps—her name is Edelweiss.

The sturdy youth, scaling in cheerful mood
Abyss and avalanche, pauses not his foot.
Crossing the sunny slope with laughing eye;

(Continued on page 699)

Plant Immigrants

WILLARD N. CLUTE

IT is a fact well known to every rambler countryward, that the flora of any region consists of two elements; a rather stationary native element and a more mobile, aggressive, exotic one. The native element is stationary because each member of it has found, after ages of struggle, the niche in the landscape which it can best fill and has settled down to occupy it, secure against nearly all comers. The exotic flora comes from the ends of the earth and, like other immigrants, is ever seeking a place in which to colonize. Its members differ from ordinary plants in that they have a strong disposition to extend their area of occupation coupled with the ability to do it. All plants have a natural tendency to spread, but it is only when they become aggressive enough to overcome the original tenants of the soil that they attract our attention. Then we call them weeds.

Not all weeds are exotic, however. Such of our natives as have the ability to conquer new territory may become as pestiferous weeds as any. The evening primrose, the cockle-bur, the bindweed and the smartweed are good examples. Nor must we overlook, in this connection, the career of the prickly pear in Australia or the ditch moss (*Elodea*) in European waters. The latter is a harmless and inconspicuous inhabitant of ponds and slow-moving streams on this side of the world, but abroad it fills up the water-courses and is so troublesome that they call it American weed.

The parts of our flora least affected by weeds are the woodlands. In all our history there appears never to have been a tree immigrant able to crowd out our native species. The *Ailanthus*, or Chinese tree-of-heaven, shows a tendency to spring up in waste grounds, as do various native species, for that matter, but it has not yet attempted to invade the forests.

Most of our invaders are herbs. They are most abundant along roadsides, on railway embankments and in the fields, partly because they have been recruited from such places in other parts of the world and partly because they move most rapidly along the regular routes of travel. There have been, of course, invasions from various directions but the prevailing direction has been ever westward as it has in the case of man, himself, who might possibly be considered a weed by an impartial observer.

The exotic plants are usually our worst weeds because their fighting qualities have been developed by perennial conflict with the cultivators of the soil. No plant could survive the age-long contest unless it possessed a vigorous constitution, to say the least. Among the qualities that make for weediness are the capacity for rapid growth, the ability to endure drouth and to grow in poor soil and the power of producing vast numbers of seeds well fitted for rapid distribution. We sometimes fail to realize how rapidly some of these plants multiply. A single plant of pigweed has been found to produce 85,000 seeds, the crab-grass is reported to do even better and the yellow foxtail tops the record with 113,000 seeds. In addition to seeds, many species have vegetative means of reproduction. The Canada thistle and quack grass have deep rootstocks from which new branches are sent up when the first are cut off. The purslane has no rootstock but it is so fortified against adversity that if cut off after it is in bloom it can go on fruiting independent of any connection with the soil.

Some European weeds have been with us so long that we have almost forgotten their foreign origin and regard them as natives. The thistle, mullein, dandelion and bur-

dock seem part of the original population. There are others, however, whose arrival is still so recent that men in middle life can remember their first appearance. The tumbling mustard, now so widespread, is one of the most recent. It is less than twenty-five years since the devil's paint-brush began to redden the hills of New York and Pennsylvania and the prickly lettuce did not become a weed in many places before 1890. No doubt there will be many more to follow. The ballast ground along our coasts where ships are wont to discharge their surplus material of this description has yielded specimens of practically every pernicious weed in the world. Many of these only wait an opportunity. They often need some special condition to get started but afterward make great headway.

The fact that a given species has spread over an extensive region, however, is no indication that it will continue to spread. Often what threatens to be a particularly troublesome weed will after a time subside into comparative harmlessness. Weeds have their predilections like other plants and must often surrender to natural conditions. The tumble weeds were once the terror of the plains. Instances are on record of their stopping trains by sheer numbers. Railway cuts were often filled with them. But when man began to fence the plains, their triumphs were over. Their last stand is in the desert and here sheep and goats make short work of them. Another plant that has gone west to experience greater triumphs is the caltrop. It thrives along sandy roadsides and is ever on the increase, aided thereto by its sharp pointed seeds which use the automobile for distribution. The frequency with which they puncture the tires has caused them to be known as puncture-vines.

For some reason the ox-eye daisy and the buttercup, so common in the Eastern States, have never penetrated to the rich prairie soils in many parts of the middle west. Here, too, the devil's paint-brush is unknown and the wild carrot is but a name. Ox-eye daisy is so rare that it is cultivated in gardens and has substituted the name of Marguerite for the more usual white weed.

Other weeds there may be that have not yet appeared for lack of traveling facilities. We have several instances of plants that began to move as soon as the way was open. The yellow daisy did not push out from the western plains until the railroads penetrated its territory. The buffalo burr has a similar history. It is quite likely that the traffic up and down the Mississippi valley is responsible for the presence in most of the Northern States of a little Mexican weed known as *Galinsoga*. So recent is its coming and so insignificant the plant, that it has not yet acquired a common name.

In general, weeds are not attractive. Their motto seems to be efficiency and beauty is allowed to take care of itself. Many species, however, are really beautiful if one could forget their weedy qualities. The flower-heads of the common bull thistle, the dandelion, the musk mallow and moth mullein, and even the daisy and buttercup, are good illustrations. Indeed, some of our worst weeds were originally denizens of the flower garden and were only rooted out after they had shown their ignoble natures by rioting afield. Among such are the toad-flax, the little spurge known as graveyard weed, bouncing Bet, chicory and catnip. In the south the really handsome water hyacinth has become an execrated weed because from its very exuberance it thrives so well in certain

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The Washington Elm

THE delegates to the convention of the S. A. F. and O. H. who visited the capitol last week were very much impressed with the work being done for the preservation of the many historic trees in the park which lies between the building where the lawmakers hold forth and the Congressional Library. The chief interest was in the Washington Elm, which gets its name from the story which is wound around it in a romantic way. Unlike the famous cherry tree episode, this one is vouched for, so the capitol guides say.

When the capitol was being constructed, it was the practice of Mr. Washington to go to the place which is now this beautiful park to watch the progress of the work. He selected this elm because of the shade it afforded and beneath its boughs he would sit and eat his lunch. This was in the days which preceded the advent of the jitney bus, and if his horse cast his shoe or something else happened, the President was likely to be away from home all day—hence the lunch and the elm tree episode.

The work of preserving this and the other well-known trees is being done by the Davey Tree Expert Co. of Kent, O., under the supervision of Martin L. Davey and his assistant, H. K. Perry. The former recently completed a term in Congress, where he became well known because of his knowledge of trees, and when it became apparent that some of the beauties of the capitol grounds were being menaced by decay, he was called into consultation by the capitol authorities.

A survey of the situation was made, and it was decided that the main feature trees should be given immediate attention, and that later efforts should be made to secure a proper appropriation to permit all of the trees needing attention to be treated carefully.

"Taking it all in all," said Mr. Davey after the survey had been made, "these world-famous trees are in pretty good shape physically, but structurally many of them are weak through decay, splitting crotches and in some instances from lack of nourishment due to the long standing of the trees. This latter difficulty will be met by the use of fertilizer introduced through crowbar holes as a temporary proposition because it would make the place unsightly now to plow up the ground and properly fertilize it."

The tree dentists, as they have come to be known, started on the Washington Elm. This stands loftily by itself near the Senate wing of the capitol. Their activities were hampered a great deal by the tourists who en-

gaged them in conversation in an effort to get the history of the tree and some knowledge of what the men were doing. These tourists came from all parts of the country and from many foreign lands. The S. A. F. delegates, having some knowledge of "treeology," appreciated what the tree dentists were striving to do, and their presence was welcomed.

This tree stands about 75 feet high. It was first treated by the Davey Tree Expert Co. about eleven years ago; since that time it has developed only three local cavities located midway up the tree on the main limbs. It was necessary to brace some of the limbs by means of three-eighths inch galvanized double strand cables, seven being used for this purpose.

A sugar maple, planted by the famous Congressman from Missouri, the late Champ Clark, was found to be rather weak, but it will be brought around all right, according to Mr. Davey, with proper treatment in the way of nourishment and watering.

A tree planted by Miss Jeanette Rankin, the first woman to be elected as a member of the House of Representatives, is a redwood, which seems to be making good headway in its new home.

The workers are treating an American elm, almost directly in front of the center of the capitol which is estimated to be about eighty years old. They have braced one limb by means of a cable and filled three small cavities. The vitality of this tree is reported as good.

An English elm was found to have thirteen cavities of medium size. This tree is about one hundred years old and its weak spots required strengthening with eight of the galvanized cables. It towers about eighty feet in height and is about four feet

through the trunk. It is one of the largest in the grounds.

Another elm has a cavity twenty feet in length. This huge stretch of filling material is laid off in blocks, giving the appearance of a human backbone, so made to permit the tree to bend naturally when swayed by the wind. Without such a system a heavy wind would break the tree. Such work as this was of great interest to the florist delegates; to many it was something entirely new and it represents one of the fine pieces of tree surgery work. It indicates study and great care in the effort to further preserve these wonderful specimens.

An American white ash having a cavity six feet long and from two and one-half to three feet wide, has to be cared for. This tree is estimated to be one hundred years

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The Washington Elm and other fine trees on the grounds of the Capitol in Washington are being preserved by the use of cement and other devices under a recent appropriation by Congress. Former Congressman Martin L. Davey of Ohio, a noted tree surgeon, is shown here supervising the work.

Bulbs for Fall Planting

BERTHA BERBERT-HAMMOND

MORE gardens would be resplendent with pleasure giving Spring flowers, if the fact were more generally understood or recollected that in order to enjoy a Spring display of many of the most beautiful and desirable flowers, plantings of the various bulbs must be made during the Autumn. Fall bulbs may be planted any time according to the variety and the locality from August to late in December, and tulips may be successfully planted on top of the ground, if soil to cover them several inches deep, topped with a mulch, is provided. Such late planted tulips bloom equally as well, though later, as those which were planted earlier in the usual manner.

Perhaps the most desirable of the hardy bulbs are the choice varieties of lilies which are of easy culture. They should be planted from six to eight inches deep in a bed of fine sand. With the exception of the Madonna Lily (*candidum*) which should be planted in August, most lily bulbs may be set out during October and November. A bed of lilies is sure to be exquisite and charming in the blooming season when

Frozen—they burst to life
To Nature's minstrelsy.
A resurrection type
Of immortality.
They neither toil nor spin,
Exist without a care,
On earth there is no king
With garb so chaste and rare.

—N. R. Glass.

The Golden Bearded Lily (*auratum*), a large, fragrant, ivory-white, crimson spotted flower with a yellow band on each petal is a magnificent variety, and the fragrant snow-white *candidum*, or Annunciation lily, cannot be surpassed for beauty, purity and stately habit of growth.

The free blooming handsome *speciosum* lilies, the brilliant coral red *tenuifolium*, and the rare *Hansonii* or yellow *Martagon* lily, are excellent varieties to plant. The varieties of *Lilium elegans* with their attractive tulip-shaped flowers may be used for garden, and also for forcing, purposes. Some of the native species, like the bell-shaped *canadense*, *superbum*, (Turk's cap) and *philadelphicum* are, though more common, quite desirable additions to the garden, and last but not least, are the old-fashioned spotted tiger lilies, of which one may now have the improved and double flowering sorts.

The great beauty and attractiveness of the Spring display of tulips and hyacinths should assure a general Fall planting of these justly popular bulbous plants, and the hardy *narcissi*, daffodils, and jonquils are in demand for use among the plants of the hardy border or for naturalizing on portions of the grounds. The bulbs of the *Narcissus* family should be planted early in the Autumn about two to three inches deep in moist loam or sandy soil. The double yellow daffodil, though old-fashioned, is still quite a favorite and holds its place in the modern garden.

There are a number of inexpensive, yet charming bulbous plants that are comparatively little known except to those to whom they are endeared by sentiment. *Scilla Siberica*, a hardy bulb, and the *Chionodoxa*, approximately called the "Glory of the Snow," bear in April lovely blue flowers which harmonize so beautifully with the

dainty, nodding snow-drop that is so hardy and early that it braves the snow and bleak winds of March to be the first to herald the coming of Spring, for

When the modest snow-drop lifts its head
Upon the grass or in the garden bed,
Hope dawns—we fancy Spring is near,
That in the copse the black bird's note we hear,
The crystal snow is pure and knows no strife,
The snow-drop breathes of Spring and teeming life,
Fears not, though frail with wintry storms to cope,
Speaks to the heart, of cheerful trust and hope.

—S. Lydia Ewbank.

The Winter aconite follows closely upon the heels of the single snow-drop, producing a large, glossy yellow flower that brings cheer while tulips, hyacinths and other bulbs better known, are still slumbering. The crocus naturalized in the grass or used as an edging plant is a very winsome Spring bloomer. This small bulb should be planted about two inches deep and as a new bulb forms above the old one each year, the crocus requires occasional resetting. There are a number of desirable varieties, including new hybrids ranging in color from white to deep purple, but

The first crocus that thrusts its paint of gold
Up through the still snow-drifted garden mould,
—T. B. Aldrich.

is a small, yellow flowered sort, called "Cloth of Gold," There is a companion variety, known as "Cloth of Silver," that is a dainty white, striped with delicate lavender.

The Star of Bethlehem, *Ornithogalum umbellatum*, of old gardens is rarely seen nowadays but in my garden. Its profusion of starry blossoms and silver striped leaves add an exquisite finish to the border.

PLANT IMMIGRANTS

(Continued from page 694)

waters as to become an actual menace to navigation.

One often notices a tendency among the weeds to foregather in certain quarters much as people of various nationalities do. There are first of all those homely but friendly weeds that love to grow close about our dwellings and farmyards—motherwort, catnip, burdock, dog fennel, jimson weed and smartweed. In old fields and worn-out soils quite another company is found. One may recognize the evening primrose, fleabane, mullein, cinquefoil, horse sorrel, vervain and toad-flax. Along roadsides flourish tansy, chicory, bouncing Bet, golden-rod, asters, and down close to the roadway, spurge, pepper-grass, shepherd's purse, knot-grass and spreading amaranth. Every crop comes to have its associated weeds and the kitchen garden has examples of nearly all of them. Any that are missing may be looked for along the railroads. By mid-Summer the river banks are a tangle of many species but here is one place, if any, in which the weeds may be permitted to flourish. The climbing cucumber, the great St. John's-wort, the cardinal flower, the great blue lobelia, the scarlet bee-balm and even the tick trefoils here make the world gay with color and, crowding no crops of ours, may be looked on with indulgence.

Native Plants for Shaded Spots

HERBERT DURAND

FROM the smallest home grounds to the largest estates, there is no residential property without one or many shaded areas. It is, therefore, not strange that the question most frequently asked by owners is "What can I grow in a shady place?"

In the effort to answer this question, the florists and nurserymen suggest and offer so-called "porch" plantings or "foundation" plantings of mixed evergreens for the north side of buildings, various creepers, like moneywort, (*Lysimachia nummularia*) Myrtle Bugle, (*Ajuga*) and *pachysandra*, for bare places under trees, and, occasionally, some of the coarser ferns for dark corners. In my opinion, none of these makeshifts solve the problem satisfactorily. The right plants are not to be found in the regulation nursery; they are denizens of the forest and can be obtained only from their native haunts or from a few growers who specialize in their propagation and sale.

Yet, when they are tastefully selected and grouped, the effects are so beautiful, so perfectly natural, that they are well worth the trouble involved in hunting them or in locating reliable dealers who will supply them.

I am going to suggest in this article, some combinations of native plants that I have found particularly attractive and pleasing, and will add lists of other desirable kinds from which an unlimited number of equally beautiful combinations may be evolved by any one. All the species and varieties I mention are absolutely hardy, require only the simplest treatment and, once established will take care of themselves and increase in number and vigor of growth from year to year.

Let us first consider "porch" and "foundation" plantings on the shady side of buildings. Before naming the plants, however, I want to emphasize the necessity of properly preparing the soil in which they are to grow. In most cases the ground immediately adjacent to foundation walls is a conglomeration of cellar clay, mason's sand, brick bats, tar paper, plaster and junk. In this stuff, even pig weeds will starve. So, if good, rich deep soil is not already present, dig it to a depth of at least eighteen inches. Fill the excavation, with good garden top-soil, mixed with compost, or, better still, with black leaf mold from the woods. This done, you can be assured of success.

Personally, the only cone-bearing evergreens I care for are Hemlocks and junipers, and those I would use sparingly. It seems to me that a mixed planting, in which there are frequent displays of color, is the kind that is most pleasing. For such a planting, Mountain Laurel, *Andromeda*, and the five native Azaleas are entirely appropriate and among and in front of these may be scattered, with fine effect, the more delicate ferns, some of the lilies, and many charming herbaceous plants.

Here is an excellent combination for a planting 20 feet long by 4 to 5 feet wide: 5 Mountain Laurel, 4 *Andromeda floribunda*, 2 Flame Azalea; 12 Maidenhair Ferns, 8 Virginia Cowslips (*Mertensia*) and, for ground cover in front, 25 of the exquisite Canada Violet (*Viola canadensis*). In setting the plants, avoid straight rows, bring a tall one almost to the edge in the center and near each end. Aim at groups, as irregular as the limited space will permit. Plant the *Mertensias* among the Maidenhair, the latter will display its graceful fronds after the foliage of the other has withered and disappeared, which it does about May 25.

A fine fern and flower combination is composed of

Goldie's Fern (tall), Evergreen Wood Fern (medium), Prickly Shield Fern (low), with Red Wood Lilies, False Solomon's Seal and Hepaticas.

Another unique arrangement is the Royal Fern, the Maidenhair, the Red Baneberry, the White Baneberry, the Purple Rue, and the Windflower. A few Jack-in-the-Pulpits look well in this group.

The following list of native plants, suitable for foundation planting in shade will be found suggestive and useful:

<i>Rhododendron Carolinianum</i>	Red Baneberry
<i>Azalea nudiflorum</i>	Wind Flower
<i>Azalea calendulacea</i>	Columbine
<i>Azalea vaseyi</i>	Shooting Star
<i>Andromeda floribunda</i>	White Snakeroot
<i>Leucothoe Catesbaei</i>	Galax
Hemlock	Wild Geranium
Common Juniper	Hepatica
Bayberry	Golden Seal
Inkberry	Crested Iris
<i>Xanthorrhiza</i>	Meadow Lily
Maidenhair Fern	Red Wood Lily
Christmas Fern	Cardinal Flower
Prickly Shield Fern	Blue Lobelia
Male Fern	Virginia Cowslip
Goldie's Fern	Wild Blue Phlox
Evergreen Wood Fern	May Apple
Narrow-leaved Spleenwort	Solomon's Seal
Silvery Spleenwort	Bloodroot
Ostrich Fern	<i>Shortia</i>
Royal Fern	False Solomon's Seal
Interrupted Fern	Foam Flower
Broad Beech Fern	White Trillium
Spiny Wood Fern	Blue, White and Yellow
Crested Fern	Violets
White Baneberry	

The care of any of these fifty kinds of plants, after they are planted, consists of keeping the bed covered with a light mulch of leaves until they are established, pulling out any weeds that appear, and never allowing the soil to become dry, during the Summer months. If Hemlocks or Junipers are used, they may be kept at any desired height by clipping off the leaders.

(To be continued next month.)

PLANT FOR YEAR-ROUND ENJOYMENT Cary A. Rowland

THE planting of evergreens has been steadily increasing in popularity for more than a decade. There must be strong reasons for this growing popularity, especially as evergreens do not offer the advantage of bloom as do the flowering trees, such as the magnolias and lindens.

But evergreens do afford all-the-year-round cheer. Visitors to the East from California speak especially of the advantage which they enjoy of reveling in an abundance of green foliage throughout the year as contrasted with the too often bare and forbidding Eastern winter landscapes. Yet our landscapes need not be bleak at any season, and they will not be if we plant judiciously with evergreens as well as with deciduous trees. There's not a day in the year when the lovely green tones of the spruce, *arborvita*, pine and other similar evergreens cannot bring an abundance of good cheer.

The Douglas Fir has been called "the tree for the million" because of its hardiness and universal adaptability. Tall and stately, it lends dignity to any planting and has replaced the once-popular Lombardy

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The Modern Dahlia

ROBERT J. EDGAR

A GLANCE through magazines pertaining to the garden will show that a large share of space is given to advertising the dahlia in one or more of its varied forms. Until five or six years ago the old show type, or ball dahlia, might have been found relegated to the rear of some gardens and spare clumps of tubers given to the neighbors; but imagine any gardener of this date who would give away a clump of the newer ones when the prices range from fifty cents to ten dollars a tuber, or in some cases a rooted cutting.

There seems to be a constant demand for the better varieties and dahlia shows are being featured in every garden club and horticultural society programme. The American Dahlia Society show will occupy the entire roof of the Pennsylvania Hotel in New York for three days in September this year; the Dahlia Society of California will at about the same time stage an exhibition in the Palace Hotel, San Francisco, even larger than the one in New York. Quite a lot of prominence for the lowly dahlia, one will say who knows the flower of old, but on being better acquainted with the modern flower one can realize what a glorious show it can and does make.

The flower grower has found that he or she can have flowers for good effect in the garden, and for cutting, at their best from about mid-August until the first heavy frost, generally mid-October; two months of bloom in the East and a much longer period in the South and on the Pacific Coast, with a variety of form and color not found in any other flowering plant.

Investment in good dahlia tubers from a reliable grower is money well spent; the clumps can be dug in the Fall and when kept under proper conditions will produce at least four or five good divisions for planting in the Spring. Why waste time and space on mediocre varieties when varieties of better color, form and habit can be had for just a little larger initial investment?

CULTURE. Soil of any kind that is well drained will suit the dahlia, in either full sun or part shade; a plot that has been heavily fertilized is *not* the best, as the plant wants to be kept just growing for its first two months, and fertilized and well watered when it is in bud, about mid-August. Many gardeners dig their dahlia beds about spade depth and rake in about four to six inches of sifted coal-ashes to make the soil porous, not that there is any particular element in the ash, for gravel or sand would answer the same purpose. From this we learn that a rich soil is not required, in fact not desirable, as it makes growth early in the season at the expense of bloom later.

TIME TO PLANT. Dahlias may be planted at any time after frost is out of the ground; but when planted early the stems are likely to get woody and the flowers smaller later in the season. For this reason planting June 1st to

June 15th is recommended so that they flower on new growth and produce much better blooms. (Note: Latitude of Philadelphia.

PLANTING. In planting tubers lay the tuber horizontally about five inches below the surface, with the eye up and the other end of the tuber slightly depressed; fill the soil up to about one inch below the surrounding soil and leave this depression to take water and to hold the manure mulch to be applied later. Allow ten square feet for each.

TREATMENT OF THE PLANT. When the young plant has five pairs of leaves pinch out the top two pairs of leaves so that the plant will branch at the intersections of the lower leaves and will make a stockier plant that will be of a more convenient height and need less staking. When the buds appear pinch out the two side buds, allowing the center ones to develop and have one good

bloom with a long stem rather than a cluster of smaller flowers or flowers and buds.

CULTIVATING AND FERTILIZING. Cultivate the ground about two inches deep early in the season, until mid-August, to force the root growth down, but not after that time, as the mulch of sheep or cow manure to be applied then will both fertilize and conserve moisture. Frequent watering of the soil is beneficial, in fact necessary during this later period.

DIGGING THE CLUMPS. About three days after frost has blackened the top growth cut the stalks and place on the compost heap. Use two forked spades, one on either side, in digging out the clumps and lift carefully so as not to break the necks of

tubers. Tag the clumps and leave in the sun for a few hours to dry the moist soil around the clump.

STORAGE. Store the clump upside-down, with the stem down, for a few weeks at least, to drain the stem out and not into the crown, as this may cause rot. Remove the clumps to a place that will register about 40 to 50 degrees, not moist enough to rot the tubers or cause premature growth in the Spring, and not dry enough to dry out all the moisture. Dry sand is fine packing material; soil will absorb moisture and rot the tubers. The cellar floor of the average suburban home is usually a good place to store dahlias, provided of course that it is not damp and does not get too warm.

VARIETIES. The growers' catalogs are quite comprehensive and certainly give a good assortment. Exhibition varieties are usually found in the Decorative, Hybrid-Cactus and Peony-Flowering types, better designations for types might be a good work for dahlia societies, as their type-names do not describe the flower. Next in the list of prize winners will be found the Cactus type, of which there are quite a few on the market now that have good neck and stem habit. Then come the Collar-ette, Pompon, Single and Show or Ball types.



Decorative Dahlia

Among the varieties that have proven worth while are:
Amy Robsart: Decorative color, coral and apricot;
 twisted petals, large size, from Oregon.

Azalea: Decorative; creamy yellow; outer petals tinged



Cactus Dahlia.

pink. A low growing plant, with 7-inch to 8-inch flowers, from California.

Betty Bird: Hybrid Show; distinct form; soft pink in color; splendid garden effect; from California.

Dr. Trevis: Decorative; a blend of copper, old rose and gold—a favorite; from California.

F. W. Fellows: Cactus; one of the best of its type; orange color; good habit; from England.



Hybrid Cactus Dahlia.

Geant de Lyon: Collarette; velvety maroon with white collar; from France.

George Walters: Hybrid Cactus; pinkish salmon with gold suffused center; one of the best; from California.

Glory of New Haven: Decorative; pinkish mauve, from Connecticut.

Great Britain: Decorative; distinct form and color; lilac to light blue; from Holland.

Helen Durnbaugh: Hybrid-Cactus; pink shaded to white; from California.

Insulinde: Decorative; distinct formation; color gold, beautiful in sunlight; good habit; from Holland.

Mephistopheles: Hybrid-Decorative; a large, scarlet, with petals tipped golden yellow; tall growing plant; from Connecticut.

Mrs. Edna Spencer: Hybrid-Cactus or California-Cactus; a fine-cut flower; white shaded lavender-pink; from California.

Mrs. I. de Fer Warner: Decorative; deep mauve-pink color; large flower of true decorative form; from Connecticut.

Mrs. Richard Lohrman: Hybrid-Cactus; pure golden yellow of fine habit, large flower; from California.

Mrs. W. E. Estes: Hybrid-Cactus; pure white; perfect form and habit; from California.

Pat O'Mara: Decorative; color soft orange buff tinted rose; all good habits and a large bloom; from Maryland.

The Grizzly: Decorative; deep maroon red; very large and very deep flower; from California.



Peony Dahlia.

The Millionaire: Decorative; pinkish lavender to white; a low growing plant with 8-inch to 10-inch flowers; from Rhode Island.

U. S. A.: Peony-Flowering; deep orange; very large; from Rhode Island.

LEONTOPODIUM

(Continued from page 693)

Onward the toilsome path leads steep and high.
 No chasm too wide, no rock wall causes fear,
 His jubilant cry betrays, the goal is near.
 Oh Joy, from mountain's brows to wrest
 The Edelweiss to deck his true love's breast.

From yonder dale, below, a silvery knell;
 A mountain-son conveys his last farewell.
 A village priest, kneeling a prayer says:
 A soul with his creator face to face.
 Mortal remains entwined by flowers wait
 Till carried gently through the churchyard gate;
 And faithful friends with sadness in their eyes
 Drop in his grave their starry Edelweiss.

Making a Lawn

FLORUM AMATOR

THE SOIL

THE best soil for a lawn is a rich, deep, well drained, clay, or sandy loam; the former is preferable since it retains the fertilizers, and withstands the drouths better.

A good lawn cannot be established where the under-drainage is so poor that the water gathers, and stands on its surface and if such a condition exists, the land must be under-drained by the use of tiles or in some other way.

Where there are only two or three inches of surface soil, and beneath it only clear sand and gravel, a good lawn cannot be made, no matter how much fertilizer is applied. It will be necessary in such a case to remove the sand and gravel to the depth of a foot or more, and replace it with a rich clay or sandy loam.

PREPARING THE SOIL

The soil should be made fine and mellow with plow or spade to the depth of a foot or more; the deeper the soil is worked and fertilized the longer the lawn will last, and the better it will withstand the drouths of Summer and cold of Winter.

FERTILIZERS

Stable manures of all kinds, pulverized sheep, cow and horse manures, bone meal, wood ashes, and commercial grass fertilizers may all be used. These should be incorporated and mixed with the soil to the full depth to which it is worked not merely applied to the surface. It is better when fresh, coarse, stable, or barnyard manure is to be used to spread these on the ground and plow or spade them in during the Autumn, and to complete the work of making the lawn and to sow the seeds in early Spring, but when well rotted stable manures, pulverized sheep and other pulverized animal manures, bone meal, wood ashes, and commercial grass fertilizers are used, the entire work of preparation and seed sowing may be done in early Spring or early Autumn. When stable manures are not easily obtained, the other manures and fertilizers previously mentioned may be depended upon both for making a new, and top fertilizing an old lawn, and many prefer them, for they are free from weed seeds, which are always present in coarse, unfermented stable and barnyard manures, which should not be used in the surface soil of a new or on an old lawn. When stable manures are used, they may be applied at the rate of 10 to 15 loads per acre. Of sheep manure, 2 to 4 tons, of bone meal, one ton, of ashes, one ton, of commercial grass fertilizer, one ton, may be used per acre, and bone meal and ashes may be used together in the weight above mentioned. Commercial grass fertilizers, which contain all the elements necessary for growing grass, when used, are generally applied to the surface of both new and old lawns to stimulate a quick growth, where stable manures have been plowed in.

PREPARING THE SURFACE FOR THE SEEDS

After the lawn has been graded, and its surface made even by raking, it should be well rolled with a roller of considerable weight. Hollows will appear which must be filled with fine, rich soil, and the lawn re-raked, and re-rolled. Should a rain storm come during this period of the work, it will show by the puddles of water which will collect in the depressions in the lawn, better than anything else where hollows are. It is not well to hurry the sowing of the seeds; give time for all the hollows to appear. What is of equal importance, if the sowing of

the seeds is not hastened, one or more of the crops of weeds which always come from seeds which are in the surface soil, and stable manures, and are not present to any extent in the grass seeds which you buy, as is often erroneously thought, will appear and can be destroyed.

If any shrubs or trees are going to be planted on the lawn, this should be done before the grass seeds are sown; otherwise it will be necessary to delay doing this till the grass has made a strong sod, for a newly made lawn should not be dug up here and there for any purpose.

WHAT KIND OF GRASS SEEDS TO SOW

Only those grasses which make a spreading growth, that is, spread by undergrown stems, are suitable for a lawn. Your seedsman will have mixtures of grass seeds suitable for every location, and if you will describe to him the location of your lawn, and the nature of its soil, he will help you make a selection of seeds. Much of the success in making a lawn depends upon a proper selection of seeds. Your seedsman, if he is given the area, or the measurements of the plot to be seeded, will also tell you how much seed you will require for seeding this.

WHEN AND HOW TO SOW

Grass seeds can be sown at any time from April to September inclusive when there is sufficient moisture in the soil, but the best periods are in April and May and September. Spring sowing is preferable because less seeds are necessary then, and weed seed do not germinate as freely as in the Summer months. When grass seeds are sown in the Summer, it is well to sow a few oats with the grass seeds, since the oat plants will shade the tender grass from the burning sun. Autumn sowing should be done early, otherwise the grass roots will not become well enough established, and will be thrown out of the soil and destroyed by the frosts of Winter.

The quantity of seeds necessary for sowing depends in a measure upon the weed seeds in the soil; the greater the probable number of weed seeds, the more grass seeds will be required. It is highly advisable to always use a liberal quantity of grass seeds, since some will fail to germinate, and some will be destroyed by weeds.

After the ground has been brought into perfect condition by repeated rakings, rollings and re-rollings, divide the seeds into two lots; mark off the plot into strips 4 to 5 feet wide lengthwise of the plot; sow one half the seeds, a strip at a time, and rake in the seeds; then mark off the plot into crosswise strips and sow the other half of the seeds in the same manner and rake them in, moving the soil out of place in raking as little as possible. Use in raking either a steel rake with long teeth set about two inches apart or a common wooden hay rake, which answers the purpose very well. In Spring and Autumn roll with a heavy roller, but during the heat and dry winds of Summer omit rolling and leave the surface soil loose to conserve the moisture. After the lawn is well established, cut the grass weekly with the lawn mower, and leave the clippings on the lawn. A spread of thoroughly rotted stable manure on the lawn in late Autumn or, if this is omitted, of equal parts of bone meal and wood ashes or of commercial grass fertilizer, each Spring, will help keep the lawn in satisfactory condition.

The diminutive chains of habit are seldom heavy enough to be felt, till they are too strong to be broken.—*Samuel Johnson.*

September Birds

PAUL B. RIIS

QUIETLY the birds are slipping away on their southward journey. Song has practically ceased and the bird lover's yard apparently presents little of interest; save for the visit of occasional migrants. But let us investigate. Our yard, covering half an acre, within the city limits principally laid out in lawns with suitable border planting, evergreen, has been the cradle of fifty-six healthy fledglings during the season, a place of almost absolute safety, a place to eat and drink and a place to roost. Water, suet, seeds, nesting material, nesting boxes, fruits wild and cultivated formed an irresistible attraction. Add to this a large black cherry (*Prunus serotina*) loaded with fruit, a golden elder (*Sambucus canadensis* var. *aurea*) bearing a fine crop of berries, a grape covered pergola, a bird bath and a handful of hemp seed. The chronicler here relates what he saw there one morning between the hours of six and seven during the early days of the month: Robins, a score of them coming and going in a playful, frolicsome way filled the yard and perched on the pergola. Some indulged in their morning ablution, others engaged in aerial combats and still others, noticeably the young, played and tugged at strings and nesting materials. Others, not yet world wise, attempted to feed on the hemp seed without satisfactory results. Several young grosbeaks, however, masters in cracking seeds, ate them with relish. A bright rosy dawn strongly suffused the breasts of the immature male. A catbird found the berries of the elder entirely to its taste, while a young brown thrasher stalked the lawn for insects. A blue jay, venturing onto the pergola, found itself unceremoniously hustled out of the yard. But now we hear familiar strains, taking us instantly back to the vast forests of the north. Sure enough it is the first ruby-crowned kinglet of the Autumn. A pine warbler, two of them, alight for a moment on one of the trees and then are gone. Flickers are trying to mingle with the robins on the pergola but soon are driven away. We level our glasses at the legs of the young robins for aluminum bands and note the tell-tale anklet on the left leg of several, banded two months back. The grosbeaks are now varying their repast with plump seeds of the purple cone flower. A pair of American goldfinches are diligently feeding on the seeds of the perennial *Coreopsis*. But here comes another guest, a transient to be sure, the olive backed thrush, and at the same time we hear the call note of the crested flycatcher and delight in his aerial performance. The twittering of chimney swifts overhead and the fine lisping sounds made by the cedar waxwings, partaking of a breakfast of black cherries are rudely disturbed by another familiar sound, not heard for many days, the scolding of the house wren. Yes, her mate is with her, too, and whether the scolding was an intended greeting or from force of habit, mattered little, she is still cognizant of her little home. The metallic chips of the chipping sparrow intensifies the social little bird sitting over yonder and here the goldfinches reinforced in number go tramping by to sample the seeds of the sunflower. A young orchard oriole appears on the scene and is shortly followed by a red-eyed vireo. The sweetly low cadence of a robin giving expression to its reminiscent mood in whisper song fill the all too short morning hour with pleasurable moments.

There are more migrants in September than any other month. Yet the coming and going is imperceptible, due to the fact that those moving away are replaced by others

en route. The movement is a gradual thinning out rather than a concentrated flight. A careful perusal of the migration list reveals the preliminary arrival of ducks, also that of the sparrowy birds when about Sept. 25 the first Winter resident may be expected. In a general way one may note the departing birds in the order following; flycatcher, swallows, waders, vireos and warbler. Anyone familiar with the diet of these birds will note that their movements are timed to a nicety with the available food supply.

Now is the logical time to make preparations for the Winter resident. Beef suet, placed on different tree trunks and protected by 1/4-in. galvanized hardware cloth will prove the greatest attraction for the woodpecker, nuthatches, brown creepers and chickadees, and seeds of hemp, millet and sunflower will entice junco, cardinal, tree sparrow, titmouse and occasional visitants. It has been proven by trapping and banding that many migrants en route stop off year after year to avail themselves of these feeding places, thus adding much to the interest of one's yard. All bird boxes must be cleaned out, repaired and disinfected now in preparation for the possible Winter resident.

The appended list records the migratory birds of Northern Illinois for a period of many years.

Arrivals.		Departures.	
Sept. 1	Virginia Rail.	Sept. 3	White-eyed Vireo.
"	3 Green-winged Teal.	"	4 Trail's Flycatcher.
"	4 Ruby-crowned Kinglet.	"	4 Olive-sided Flycatcher.
"	6 Henslow's Sparrow.	"	5 Bartramian Sandpiper.
"	14 Gadwall.	"	6 Yellow Legs.
"	14 Blue-winged Teal.	"	10 Kingbird.
"	15 Yellow-bellied Sapsucker.	"	10 Yellow-throated Vireo.
"	17 White-throated Sparrow.	"	12 Barn Swallow.
"	19 Caroline Wren.	"	14 White-rumped Sandpiper.
"	19 Golden-crowned Kinglet.	"	15 Savannah Sparrow.
"	21 Slate-colored Junco.	"	17 Cliff Swallow.
"	23 Hermit Thrush.	"	17 Philadelphia Vireo.
"	25 Mallard.	"	20 Red-shouldered Hawk.
"	26 Holboell's Grebe.	"	22 Semi-palmated Sandpiper.
"	30 Baldpate.	"	22 Crested Flycatcher.
"	30 Fox Sparrow.	"	23 Common Tern.
Departures.		"	23 Least Flycatcher.
Sept. 1	Indigo Bunting.	"	26 Ruby-throated Hummingbird.
"	2 Warbling Vireo.	"	29 Black Tern.
"	2 Orchard Oriole.	"	30 Sora Rail.
"	3 Semi-palmated Plover.	"	30 Black-billed Cuckoo.
"	3 Migrant Shrike.	"	30 Acadian Flycatcher.

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 692)

has such plants as Mullein and *Corydalis* growing in its chinks, is the rock garden. This has the usual concomitants of a pleasing rock garden—well placed rocks, a small stream, waterfall and pool, and, most important of all, tasteful planting. Here by the use of dwarf shrubs, and herbaceous plants, combined with the more diminutive alpine an ensemble has been created that when viewed as a whole conveys nothing but pleasure. At the same time a closer inspection reveals choice treasures in the shape of rare alpine plants that delight the connoisseur.

Although viewed at a time when everything was suffering from the appalling drought, for nothing had been watered, a visit to this garden gave a pleasurable and instructive afternoon and one could visualize its wondrous beauty in early Spring with the rock garden at its best.

The Tiny Insect's Wonderland

DR. E. BADE



Nut weevil (*Balanius nucum*)

THE sun laughs from a clear blue sky, trees and bushes throw their sharp shadows upon the fresh, green meadows; no wind plays in the leafy tree tops; the flowers appear to sleep; the intense heat has silenced the happy song of

the birds, but the insect world is quickened into life and animated with new vigor as the sun becomes warmer and warmer. The ants run quickly and rapidly about their accustomed streets. They seem to be in a great hurry today and whenever two meet a short conversation is held, the feelers vibrate against each other and thus important news is exchanged. In all prob-

Summer, their colonies are in their greatest development and are most numerous, the workers diligently collecting nectar. With loud buzzing noise the large, heavy bumble-bees come flying, creep deep into the flower, gather, with their long sucking tubes, the honey from the depth of the calix where the bees cannot penetrate. But those bumble-bees which have short probosces and cannot reach the deeper lying honey in a direct way, simply gnaw the floral envelope open and so gain access to the sweet food. The flowers are treated even more shabbily by some of the wasps, which are only too often destroyed by them. Their entire bodily build is not adapted for floral visitations, but, in their adult stage, they often feed upon the products of the flowers. Their larvæ are fed only a short time with these and are raised upon other insects, especially flies. In its way *Sphecius speciosus*, a wasp, is an especially great robber. It builds roomy homes from clay and brings, as food for the larvæ, the common cicada *Tibicen pruinosa*. This cicada appears in July, when it sings its loud and



Potato beetle
(*Chrysomela decemlineata*)



Ant
(*Solenopsis xyloni*)



Green-pea plant louse
(*Nectarophora pisum*)

ability this communication relates to some rich spoil, for the ant turns off short and takes the way the other has just come, while the first resumes its way towards its home in order to call more help. In these small colony forming animals, competition, which is so prevalent throughout all Nature, has long since died and community life has taken its place. No one is the possessor of all, that which is present belongs to the individual as well as to the community. All help build their home; all go on

shrill song from the trees. This lures the wasp. Restlessly she flies about the tree and as soon as she sees her victim she hurls herself upon it. The cicada knows her enemy and in her despair she gives a squeaking cry. The wasp quickly bores her sting into the body of the cicada, this paralyses the animal without killing it, then she carries it to her home. In order to bring this heavy cicada, the wasp carries it to a certain height up the tree and then glides downward with it to its nest.



Dendryphantes whitmanni



Honey bee



Digger wasp carrying a cicada to her burrow (*Sphecius speciosus*)

the hunt; all protect their home against the common enemy; the young are taken care of by all; one animal helps the other, none is jealous of the other.

Ant and bee colonies are lasting, even passing the Winter in its entirety. Wasps and bumble-bees on the other hand dissolve their colonies in the Fall, the exception being the fertilized queen which seeks shelter for the Winter, in early Spring forming new colony. In mid-

In the grass and on the flower beds the wolf spiders hang around. They do not build webs like other spiders, but catch their foe with a sudden jump. Day and night they are ready to catch their prey. This animal has eight eyes, the two larger ones in front are used in the day-time, the others are night eyes having a reflector which concentrates the light of twilight. The habits of *Misumena* which one finds in the garden sitting on the leaves of the

flowers, are similar. Their color which is green makes them practically invisible and indistinguishable. The animal knows the value of its protective resemblance and coloring and remains on one and the same place even when disturbed.

Over there by the hazlenut bushes a peculiar, tiny beetle runs about, the hazelnut borer. In its work this insect is best observed when the hazlenut flowers have fallen and the young nut begins to develop. Then the female bores a tiny hole into the nut and places in it a single egg. In this way one nut after another is bored and becomes the repository of the eggs. When the female has laid all of its eggs it has accomplished its purpose in life and it dies. In the meantime the larvæ have hatched from the eggs. These then eat the kernel but leave all those parts which are necessary for the full development of the nut. Although about three-quarters of the kernel is eaten by this white larvæ, externally the nut appears perfectly sound. When the larvæ is fully developed it gnaws a round hole through the shell of the nut, crawls through it, falls on the ground, penetrates a short distance into it, and here it makes its metamorphosis into a beetle.

A parasitic life is led by the Ichneumon flies. The greater part of the life of the larvæ is passed in the body of other insects, where they live upon those tissues which are not essential for the life of their involuntary host. Just before the larvæ stage is ended and the pupa stage begins, do these insects bore their way through the skin of the host. A few remain in their host until the pupa stage is completed, under these conditions the host pupates also but the Ichneumon fly leaves the pupa of the host before it dies. The females of these insects prefer caterpillars in which to lay their eggs, but these useful parasites also deposit their eggs in other larvæ. The females fly around their intended victim and then calmly settle upon it. Instinctively the larvæ knows its enemies, it turns and twines convulsively, but all in vain, the fly does not even seem to notice its convulsions. The Ichneumon fly remains quietly upon the caterpillar and enters its egg tube the whole length of the body. In this position the fly remains motionless for a few minutes, the abdomen moving slightly when the egg passes through the egg-tube and is pressed into the body of the caterpillar.

In those protected places of the garden where the wind does not ripple the leaves, the home of the leaf lice are found. Here they sit on the young shoots and have bored their sharp proboscis into the delicate plant tissues from which they drink the sap. The sucking tube penetrates deep into the tissues and the contents of one cell after another is sucked dry, but the main conducting bundles remain untouched. These animals take large quantities of carbohydrates and proteids from the plants.

Leaf lice multiply very rapidly in dry, hot weather and when the plants grow luxuriantly by the addition of manure. Many species of leaf lice have, on the third abdominal segment, two short tubes, the honey tubes, and nearly all species exude from their abdomen a gelatinous, sugary fluid, the so-called honey dew, with which they cover the leaves. This is eaten by many insects, especially by ants.

The many peculiar conditions in the reproduction of leaf lice lacks, in a few instances, a complete explanation. The Winter eggs which hatch in Spring are only capable of developing females which are able to bring young into the world without fertilization. The latter, after a few molts, also give birth to living young without being fertilized. In this manner about nine generations can follow each other during the warm season. Only the last generation is capable of developing males and females. These, after fertilization has taken place, lay the Winter eggs. The males are nearly all winged, the fe-

males but seldom. The development of the sexes depends upon the lowering of the temperature in the Fall, during the warmer season only parthenogenetic reproduction takes place.

Other sap sucking insects are the numerous species of cicada which, especially in the warmer countries, develop into countless numbers. The tiny forms—which as a rule are too small for the unaided eye to appreciate their form—belong to the most peculiar living things which Nature has developed in the insect world. When magnified many of these appear like the monsters of former geological epochs, protected with armor, and armed with horns and other protuberances. The playground of these tiny insects are the meadows and the foliage of trees and shrubs. Upon walking through these places one scares many of them and these then let themselves down upon the clothes, where they resemble little bars. Sometimes they will run rapidly for a short distance, but often they are only seen for a moment. Then they jump with the aid of their wings and their jumping legs to another place, run a few steps, stop a second, draw up their jumping legs and hop back into the grass. On beautiful evenings the light on the porch will lure many of these. It seems to blind them and holds them within the magic circle of its rays. In the course of the Summer one species follows hard upon the heels of another, this species is predominant this month, another the next, and so on throughout the hotter months of the year. But how many of these tiny little fellows are hidden in the foliage can scarcely be conceived.

The grotesque form of the body of these minute cicada is the result of a development which gives the body the appearance of part of a plant, and the plant is necessary for the life of this animal. The female bore with their egg tubes, holes or slits into the twigs and lays their eggs. Here the young develop and after casting off the outer skin a number of times before they are fully developed, they live upon the sap of these plants. Some of the cicada form a white froth about them in the larvæ stage. These are the "spittle" insects. The froth consists of plant sap which has passed through the body and is then shaken by the abdomen thus bringing in air which is held as bubbles by the viscid quality of the liquid. In no way does this froth protect the young larvæ, for various wasps seek this froth, remove the larvæ from this covering, and take it to their brood for food.

THE WASHINGTON ELM

(Continued from page 695)

old, about sixty feet high and more than three feet through.

There is another elm opposite the Senate office building that is sixty feet high and about two and one-half feet in diameter. This has eight cavities which were weakening the larger branches to an alarming degree—this case was a serious one for the tree dentists. Treatment similar to that accorded the ash was prescribed for this fine specimen.

The Cameron elm is another of the trees having a touch of romance. This stands on a knoll at the east side of the House wing of the capitol. Its retention there required the walks to be built around its base, with space enough left for the roots to take nourishment. This tree is about eighty years old. It has wide spreading branches and is in good physical condition, but the wood of the large branches in some cases was weak, necessitating bracing with the galvanized strands.

It is hoped by the capitol authorities that next year Congress will make an appropriation large enough for Mr. Davey to continue the work.—*Florist Exchange*.

Work for the Month in the Garden

SAMUEL GOLDING

WITH the middle of September our thoughts turn to the harvest, for at this time some of the main crops and Winter supplies will be gathered in. The past Summer has been, to say the least, somewhat arid, and some subjects have completed their growth and have matured at an earlier date than has been the case when the seasons have been marked by a more abundant rainfall. In some cases the atmospheric conditions have proved unfavorable to some subjects, while others have apparently revelled in it, so no doubt by the end of the growing season we will probably reach an even balance. The advantage of possessing a good irrigating system will have been fully demonstrated this Summer.

But while thinking of harvest, there can be no let up or cessation of endeavor in the vegetable garden. Our aim must be to prolong as far as possible the season of production.

Continue to cultivate between the rows of growing crops; thin out spinach, and keep it clear of weeds. This will soon be one of our most valued crops after a few visits of Jack Frost to the garden.

Thin turnips, late beets and lettuce, and tie large plants of endive with raffia to blanch the hearts. Plant out in frames more lettuce and sow radishes and small salads. Make a sowing of string beans, carrots and beets in pits.

Tie up the leaves over the hearts of cauliflowers that have formed. This keeps them clean and white, so desirable is this vegetable. Continue to earth up celery at regular intervals of about two weeks; keep the side shoots removed, and give a thorough watering at the roots before earthing. Watch out for rust, and spray with Bordeaux mixture should it appear.

As soon as the potato vines commence to die down and the tubers have finished their growth, it is often advantageous to lift the crop as soon as it can be done, especially so should there be any disease present, or the soil of a wet, heavy nature. Choose, if possible, fine weather for this operation, so that the tubers can be well dried by the sun and wind before removing to a cool shed. Should disease be present it is advisable to shake a little air slaked lime through them. This does much to dry the whole and prevents the spread of disease. However, every precaution should be taken to exclude diseased tubers when being gathered in.

The main crop of carrots can be carefully lifted, cutting off the tops, and after being reasonably dried, stored away in the root cellar, or in another cool place.

Give attention to the onions previously harvested. If these are laid out thinly in a cool shed it is advisable to turn them over at intervals to keep them dry, otherwise disease will appear. Keep the thick and seedy stemmed ones for immediate use. Pull the remaining ones from the beds and after drying, remove to shed, using the ground they were in for a crop of Winter Spinach.

Where mushrooms are wanted for the Winter, and adequate provision for their culture is available, materials for the beds should now be collected. Enough should be gathered at one time to make the bed of the required dimensions, turning it over daily to sweeten the mass, as it takes less time at this season of the year than during the Winter as evaporation is more rapid, and there is danger of the material becoming too dry. It is good

practice to add a small percentage of chopped loam, as this helps to retain the moisture.

Some means of protection should be provided for string beans and other tender subjects in case of early frost. This unwelcome visitor may be expected toward the end of the month, and if any unpleasant results can be warded off, full production might be prolonged for a month.

During September the flower garden is a riot of color, the wealth of variety of plant life, both annual and perennial seem to vie with each other. The varied shades of yellow and brown of the Heleniums, the blue, purple, pink and white of the hardy asters of the *novi belgii* and *novae-angliae* types, Boltonias, and salvias, both bright-colored cannas and gladioli, and the myriad forms and shades of the annuals, create a picture that cannot be surpassed at any other season of the year.

At this time the dahlia enthusiast comes into his kingdom, and one finds much to enthuse over when seeing the beauties that are ours today. A slight dressing of nitrate of soda will help force them on. This must be used sparingly, especially by those who are not well versed in its use. But while we are admiring the gems that are here today, it is also time to prepare for next year's display.

The lovers of the peony will be busy adding to their list, and making preparations for the planting, dividing, and transplanting of the stock where necessary. The peony loves a deep rich soil, so use good rotten manure which should be forked in deeply. When planting, cover the eyes about two inches below the surface. It is a good plan to give them a mulch of litter during the first Winter after moving, applying the mulch after the ground has frozen.

The gorgeous Oriental poppy can be moved now. Most of the Spring blooming plants move well in the Fall. Continue to propagate bedding stock, cuttings of *ageratum*, verbenas, *pentstemon*, and if one has these in variety, especially suitable regarding color or habit for the particular use made of them, it is advisable to raise a stock by taking cuttings, although these are easily raised from seed if sown in Spring, but the seedlings cannot be relied upon with the same confidence as the plants raised from cuttings. Transplant seedlings of perennials in good soil in order to have good plants to place in the border next month, or in the Spring.

September is a good time for transplanting and moving evergreen shrubs—conifers. Have the holes dug for their reception and make any preparations necessary to avoid delay when the plants are received, and to prevent possible injury to the roots, if exposed to wind and sun. Even when the ball is well protected with burlap, a strong wind soon dries the roots, and this is detrimental to their welfare.

Such kinds of apples and pears as are fit, will now be harvested, that is, if the fruit comes off easily from the stalk when gently lifted. It pays to handle all fruit with care, and to grade them at the period of storing which should be in a cellar or some cool room.

See that recently seeded lawns do not suffer from lack of water. If sown late, they should have all the encouragement possible to help them to become well established before the Winter is here.

The Greenhouse, Month to Month

W. R. FOWKES

SEPTEMBER is a very exacting month. Frost is expected and half hardy plants must have their pots cleansed and brought indoors before the end of the month.

Chinese and Indian azaleas are the suitable varieties for early work and if they are desired for Christmas, an early habit must be induced by bringing them into the conservatory soon. See that they are cool and that water is kept away from their foliage, or a new growth may be started that will arrest your good intentions. Do not feed them at this period.

The fruit trees in pots must be overhauled. Prune and repot, but be careful not to overpot, merely taking out and transferring to pots of the same size. Reduce the ball of earth sufficiently to accomplish it. Use three parts rough loam, one part old mortar rubble, a six-inch pot of bone meal to a hundred pounds of the soil, and a four-inch pot of Scotch soot. Pot with soil in a fairly dry condition, taking time to do it well. Ram very firmly with a hard, wooden rammer, leaving enough space for subsequent waterings. Soil should be cut and stacked for next year's work. Old heaps should be scattered in low parts of the garden. The best turf is none too good to grow plants in. Place a layer of barn manure with three layers of turf and a stack should also be left without any manure.

Chrysanthemums have reached an important stage in their brief period of existence. Confine all watering to the forenoon and still use Grape Dust over the foliage to ward off fungus diseases. Sprinkle lime under the bench. Fumigate once weekly. We need a complete food for the 'mums now, and I have used Charles H. Totty's plant food with great satisfaction. You do not need any other.

One pound of it dissolved in fifty gallons of water and used every five days is ideal. The brief period from retaining the buds until blooming time demands a lot of food of the proper kind, for the soil has lost its good properties now, and only acts in a mechanical way as a reservoir for the reception of liquids for the plant's existence.

Complaints are made of field grown carnation plants being hard and woody, and inclined to be lazy, as it were, in making new growths. The fault was with the exceptionally hard time they had outdoors, so we must try to assist Nature. She will do her part nobly, but likes a little assistance.

Nitrogen must be given but as we cannot give it to the roots at this time, we must use the hypodermic method. Dissolve one ounce of sulphate of ammonia in one gallon of water, and spray overhead once a week until the plants behave better and then discontinue. It will also clean off any red spider that might affect them outdoors. It will assist the young weeds to grow for a time among the carnations. Weeds are plants growing in the wrong place, but when they have a mission to perform to help aerate the soil, they can be left alone for a given period.

Any palms that need repotting should be attended to. The soil they want is loam and sand. Potted very firmly they make roots slowly during the Winter and will be more stately and strong next Summer if potted now and grown cool.

Dracenas and crotons should be kept quiet and not

excited with too much heat. Give them a fairly light position and no food until next Spring, or you will get an unbalanced plant.

It is the better method in orchid culture to have roller blinds which can be raised in dull weather, but many houses containing orchids have simply a coat of paint or lime wash. Some of it must be taken off the glass over the cattleyas, however, to ripen the growths that will produce blooms, as they are looking for more light.

Calanthes should be kept a little warmer than the cattleyas and receive a good watering once a week of chicken manure, which should not be too strong. *Oncidium bicallosum* and *Dendrobium Phalenopsis* and *Cattleya labiata* like a little extra warmth from now on, not forgetting the *Phalenopsis*. Reduce the watering, and a very little spraying is needed. It depends on your treatment now whether or not they are going to bloom or remain poor looking ornaments, as they appear to many people who do not understand them.

Bulbs for succession should be started cool and can be forced at leisure. Do not forget the spiræas. They were scarce last year but they are one of our choicest Winter bloomers for decorative purposes. When they are received, pot into any kind of soil and do not give them water freely until they have attained a growth of ten inches or more. Over-watering has destroyed scores of these beautiful annual plants that are otherwise of comparatively easy culture.

I saw a fine example of sweet pea culture last Winter at William Vert's. They were in boxes eighteen inches deep and attained the enormous height of eighteen feet—truly marvelous. Mr. Vert ascribes his success to sowing the seed thinly. Now is the time to sow and while we cannot grow them all to perfection, if we do not crowd we shall buy less seed and reap more pleasure. Sow three seeds in a three-inch pot and they will be in good condition to take the place of the first vacant 'mum bench.

It may be necessary to start fires for some plants, but an unusually hot October is predicted, of which we must take due notice and govern ourselves accordingly.

You find yourself refreshed by the presence of cheerful people. Why not make earnest effort to confer that pleasure on others?—*L. M. Child.*

A PRAYER

Nettie Orcena Wolfley

Dear Father, tend the garden of my thoughts,
Thy dearest care,
And uproot every weed and flower Thou hast
Not planted there.
Give me, to keep my paths and borders straight,
Thy Golden Rule,
To fashion them like his who left for men
No sharper tool.
Teach me to know at sight, in any guise,
One noxious weed,
The "root of bitterness" which, spring up,
Bears evil seed,
Warm with the sunshine of Thy love the soil
Around each tree
That, looking from the earth up toward Thy light,
Bears fruit to Thee.

—*Christian Science Sentinel.*

DEMONSTRATING THE IDEAL TRIPLEX MOWER

WHEN the park superintendents of the United States and Canada met in Detroit on August 23 to 25, a very interesting demonstration of power mowing machines was conducted at Belle Isle Park, Detroit.

The illustration is a photograph of the Ideal Triplex Mower which was taken at the convention and was



Ideal Triplex Mower being demonstrated at Park Superintendents' Convention

demonstrated for the first time with several new features, which have been recently added. This Ideal Triplex mower was first placed on the market early this year and the machines that have been sold in various parks, golf clubs, etc., have been demonstrating quite forcibly the economy which they provide in taking care of large tracts of lawn.

As will be noticed by the photograph, two cutting units are pushed ahead by the two large tractor wheels. The third or middle cutting unit is hung in the center between and behind the two large tractor wheels. The mowers are easily elevated from the ground by a conveniently placed lever and the control of the machine is such that cutting can be accomplished in very close quarters.

Another significant fact is that the Ideal machine will cut corners just as smoothly and evenly as a hand mower, due to the ease with which the operator can manipulate the machine. The three cutting units mow a swath 84 inches wide and the machine can, with perfect safety, be run at a speed that will enable cutting approximately thirty to thirty-five acres of grass per day.

SHORT COURSE IN FLORICULTURE AT CORNELL UNIVERSITY

FLORICULTURE, or the growing of flowers and plants under glass which was originally, a luxury of the wealthy has developed into a profession which is now one of the most important of the agricultural

specialties. Today, floriculture is a profession based on scientific knowledge. There is not a town of importance in New York State which does not have one or more floral establishments. In fact New York is distinctly a flower-growing state and the glass area devoted to the culture of flowers amounts to something over 13,000,000 sq. ft.

Competition is becoming keener among flower growers and progressive young men now engaged in the business should realize that they owe something to themselves in the way of self-development and knowledge of what is going on in this progressive industry. In order to assist the young men who cannot come to the University for the regular four year course the Department of Floriculture is prepared to give a short course, covering a period of about twelve weeks along professional lines, November 9 to February 18.

Two highly specialized courses will be offered this Winter. The first will be known as "Commercial Floriculture" and will consist of a study of the culture of greenhouse plants and cut flowers for wholesale and retail markets. Floral decoration will also be considered to some extent in this course. The second course will deal with "Commercial Greenhouse Construction and Heating," and will include studies in the design, location, cost and the maintenance and the drafting of specifications. In addition to the courses mentioned Agricultural Chemistry, Soils, Plant Diseases and Injurious Insects are required subjects and the student may elect Gardening and Garden Flowers, Landscape Planning and Planting or Plant Breeding.

Upon the satisfactory completion of the courses and after a student has subsequently spent a year in practical work the college grants a certificate of proficiency on the approval of the professor in charge of the course and the proprietor of the establishment in which the student has been employed.

A booklet descriptive of all courses given during the winter months in the College of Agriculture will be sent upon request by addressing the Department of Floriculture or the Secretary of the College of Agriculture, Ithaca, N. Y.

PLANT FOR YEAR ROUND ENJOYMENT

(Continued from page 697)

poplar, being longer-lived and equally attractive throughout the year.

The Retinosporas are among the most useful of our ornamental evergreens. They are especially satisfactory for planting about the foundations of buildings, thus softening the otherwise harsh lines and enhancing the beauty of the architecture. They may also be used successfully in front of taller growing species of evergreens. The retinosporas are slow growers and never attain great height. They thrive best in somewhat sheltered locations and do not relish exposure to harsh gales.

The Colorado Blue Spruce and its variation Koster's Blue Spruce are greatly admired for their rich steel-blue foliage. The Koster's Blue Spruce should be grown from grafted scions on sturdy seedling roots. Otherwise it cannot be relied upon to come true to color. These trees are hardy and quick-growing. No planting of evergreens is complete without one or more.

Other desirable evergreens are the hemlocks, arbovitae, cedars, junipers, pines and yews: With all this wealth of colorful evergreens to choose from, there is no excuse for bleak, unsightly grounds at any season of the year in any section of the country.

A Lesson on Vegetative Plant Reproduction

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

TAKEN in a wide and general sense, the most distinctive difference between a plant and an animal is that the latter cannot be reproduced from any of its parts, nor otherwise than from a fertilized egg. While it is true that we can take a certain part from one animal and graft it on to another of the same species, or even a different species, we cannot take away any portion and grow it into a perfect organism.

With a plant, however, we can take a shoot or other detachable part, such as shoots, bulbs, bulb-scales, tubers, buds, and leaves, and from these produce perfect plants; all these forms of plant reproduction and others of a similar nature, being known as vegetative, in contradistinction to reproduction from seed.

By the use of the vegetative—technically, asexual—method of plant multiplication we are practically certain to obtain plants alike in every respect to those from which the parts have been taken, which is not always the case with reproduction from seed; in fact the asexual process is, in the majority of cases, the only means of reproducing varieties—as distinct from species—with certainty.

As we have before pointed out, growth, in both plants and animals, takes place only by the multiplication of individual cells. From facts as they stand it appears certain that the plant-cell contains within itself all the elements required to produce a perfect plant, which is evidently not the case with the animal-cell.

The most common method of multiplying plants by the vegetative method is by cutting off a shoot, root, or leaf of a plant, and placing the portion removed under such conditions that some at least of the living cells will produce roots, and by this means an entirely new plant can be brought into existence.

In all living organisms, whether plants or animals, we find that cells have the inherent power of forming what may be termed, healing or protective tissues. The use of gardening tools may cause abrasions of the skin or blisters to form on one's hands; it will not be long, however, before a thickened protective skin will be grown over these places. When a branch is cut from a tree the living cells of the inner bark, or cambium, will soon—sooner in the growing season than when the tree is dormant—commence a growth which will ultimately cover the wound, this growth is known as a callus. The reason for painting the part from which a branch has been removed is to prevent the entrance of fungi causing decay until the new tissue covers the wound, which will eventually be the case if complete healing results.

As a rule, the first apparent change in a cutting of woody plants is the formation of a callus upon the lower end, and it is commonly thought that this process must be well progressed before roots can form. But roots do not arise from the callus itself but from the internal tissue, and in many cases they appear to bear no relation to the callus in position. In willows for instance, roots arise through the bark at some distance above the callus. Further, a callus may form on a cutting which never roots at all. At the same time the best results are obtained from callused cuttings, especially if the cuttings are from mature wood. This, however, is probably due to the fact that some time generally has to elapse before the formation of the adventitious buds which give rise to roots are formed, and not to any connection between the callusing and the rooting process. Undoubtedly the formation of a callus at the bottom of a cutting is Nature's method of preventing decay, or at least of holding it off until roots are formed; roots rarely, if ever, grow from a cutting after the decay of the bottom has commenced.

It is a singular fact that the lower, or proximal, end of the cutting as it stood upon the parent plant, produces roots, and the upper, or distal, end, produces leaves and shoots; if the cutting is inverted so that the top is placed in the soil roots will never arise from it. This is true in principle even of root-cuttings; it is only at the end which grew nearest to the plant that roots are produced. If a cutting is divided into several parts, each part will exhibit the same differentiation of function. The reasons for this wonderful localization of function are not understood, although the phenomenon has frequently been the subject of study, but it appears undoubtedly to be one of the numerous examples of the Directivity of Life which abound in Nature.

Nearly all plants may be propagated by cutting from one or another of their parts, but the ease with which they can be multiplied in this way varies considerably with different species, and with even varieties of the same species.

Climate no doubt exerts a marked influence upon the tendency of plants to develop from cuttings. In certain localities in southern Europe and parts of South America, branches of the apple tree sharpened and driven into the ground often take root and sometimes even bear fruit during the same season. Again, with some species like the willow, a stem will root under almost any conditions. In practically all cases a warm, moist atmosphere is the most favorable condition for the propagation of cuttings.

The part of plants to be used for stem cuttings are preferably the younger, matured growth, since the tissues of these are the most vigorous. The cutting should always contain one or more buds. A soil warmer than the air above it is important in many cases, as warmth stimulates growth, and when applied to one part of a plant it stimulates the growth of that part. If the soil about a planted cutting is warmed to a temperature considerably higher than that of the air above it, the growth of the roots is stimulated; in fact bottom heat often excites growth in cuttings which will not root without it. On the other hand when the soil is much cooler than the air, if the temperature of the latter is high enough, leaf growth is stimulated before that of roots, and before the latter are formed the vigor of the cutting is reduced or perhaps entirely exhausted.

Since we have better facilities for raising than for lowering the natural temperature, propagation from cuttings is easier at a time of year when the temperature of the atmosphere does not much exceed fifty degrees. By observing special precautions, however, it is possible to propagate many plants from cuttings during the warm season.

With cuttings having leaves upon them, transpiration must be reduced to a minimum until roots are formed, because water cannot be freely taken up without the existence of root-hairs. For such cuttings, therefore, the air as well as the soil must be kept abundantly moist, and during the greater part of the day the direct rays of the sun must be intercepted by shading.

The alternations of temperature in the open air are as a rule unfavorable to the development of cuttings, although many plants are readily propagated by cuttings out of doors. Invariably, therefore, some structure which will confine warmth radiated from the ground, or artificially generated, as by a hot-bed, or that may when necessary shut out part of the solar heat, is always of great assistance in rooting cuttings, and in many species is essential to success.

Outside a greenhouse specially arranged for propagating a cold frame is the simplest structure for a number of cuttings. For a small quantity a box which can be covered with a sheet of glass answers every purpose, and a bell-jar or even a fruit bottle can be inverted over cuttings. With these simple appliances many plants may be successfully propagated by cuttings during August and September, among which may be mentioned roses, currants, gooseberries, most shrubs and other hard-wooded subjects. In these cases cuttings should be of the current year's growth, which have become firm; soft, very young growth is in these cases of no value for the purpose. In the case of soft-wooded plants like fibrous-rooted begonias, coleuses, geraniums, it is the younger growth which is used.

Sand is invariably the best material in which to insert cuttings, and the cutting-box or bed must be well-drained. Some plants will root freely in ordinary garden soil, or in pure water. Sand should be clean, rather coarse and sharp, but it needs to be selected with care as it often contains injurious mineral matters. Sand found along the borders of fresh-water streams may generally be used without washing, but that dug from sand pits should invariably be exposed to the sun for a few weeks and then thoroughly washed before being employed for cuttings. It should always be free from organic matter and decaying material in sand favors disease. The same sand should be used for but one lot of cuttings, for it is liable to become infested with fungi.

With soft-wooded plants, damping off of the cuttings frequently causes trouble. This may to a great extent be prevented by sterilizing the sand, and for this purpose small quantities may be baked in an oven or scalded with boiling water. The glass covering should be removed daily and the condensed moisture wiped off it.

For convenience we separate stem cuttings into two divisions, namely, those from dormant, and those from active, plants, as the requirements of these two classes differ in some respects.

Plant processes may not be wholly suspended during the dormant period. Although food preparation is wholly stopped, root growth and the callusing of injured root surfaces proceed to some extent in unfrozen layers of soil during Winter. This is true not only of the plant as a whole, but also of detached parts of a plant if they are protected from evaporation. If cuttings are taken from a dormant plant in the Autumn and stored under suitable conditions during the Winter, the cut surface at the bottom of the cuttings will partially callus over and the formation of roots may commence during the Winter.

Cuttings of this character should be stored in a place sufficiently moist to prevent loss of water by evaporation, but not warm enough to start leaf development. Root growth may proceed at a temperature too low to excite the buds. These conditions are usually fulfilled by placing the cuttings in a moist cellar where frost cannot enter, but it should be as cool as possible, and cover them with moist sand, or they may be buried in the open ground below the frost line. In not too severe climates the latter method is often preferable. Stored cutting should be taken up and planted in the Spring before the buds expand.

Cuttings of evergreen plants should not be buried, as this would destroy the leaves without which they rarely root. Evergreen cuttings are usually made in the Autumn, and planted at once in boxes of sand and kept for a time in a light, moist, cool place until the growing points of the roots have formed, after which they may have a warmer temperature.

Stem cuttings of the currant, gooseberry, and other hard, shrubby plants are sometimes made in the Autumn as soon as the wood of the current year has ceased to grow, and planted at once in well-drained loamy or sandy soil in the open ground; thus treated they will generally commence forming roots before Winter. They should be mulched on the approach of freezing weather. In the Spring it is advisable to shade them for a time until well-rooted.

Stem cuttings usually form roots more promptly and with greater certainty if they are cut off immediately below a node or bud. Unlike the root, a plant's stem is divided into successive sections, comparable in part to the stories of a building. Each section consists of one or more leaves attached to the distal end or point of the stem. (Distal means farthest from the point at which the growth started, and is opposed to proximal, which means nearest point of origin.) The part of the stem to which a leaf or leaves are attached when growing is called a node, and the part below the node, or, in the stem as a whole, the part between the nodes is termed the internode. The nodes are distinctly marked in the younger stems of most plants by a slight enlargement, or by leaf-scars, if the leaves have fallen. The nodes are centers of the greatest vital activity, and are points at which lateral growing points (buds) are usually formed, and on account of being thus more active centers roots usually start first from them in cuttings or layers.

Green-wood cuttings are more commonly employed than those from mature wood, as they generally root more quickly. All soft-wooded plants can naturally only be increased by green cuttings. House plants, as geraniums, coleruses, carnations, fuchsias, and the like, are grown from soft young wood, and many hard-wooded plants may be grown in the same way.

In making a cutting of soft and growing shoots, the first thing to learn is the proper texture or age of the shoot. A very soft and flabby cutting does not root readily and is also especially liable to damp off; while too old growing wood is slower to root. The ordinary test for beginners is the way in which a shoot breaks. If, on being bent, the shoot snaps off squarely so as to hang together with only a bit of bark, it is in the proper condition for cutting; but if it bends or simply crushes, it is either too old or too young for good results. With green-wood cuttings it does not usually matter about cutting the shoot just below a node. The greater transpiration from green-wood cuttings renders propagation in the open air scarcely practicable.

While the propagating house is necessary for the extensive multiplication of most plants from cuttings, the amateur may readily propagate a limited number in the window of a living room either in a box of sand, or by the so-called "saucer system," in which the cuttings are placed in glazed saucers containing sand which should be kept constantly moist.

Some plants will root in fresh, spring water, and this method is almost entirely used with mature-wood cuttings of the Oleander.

Those who are troubled with that pestiferous weed, wild morning glory, are aware how readily the smallest piece of root will grow into a plant, and there are a number of plants which can be likewise multiplied by root-cuttings, but the method is not much used in practice, except in a few special cases.

All root-stocks or underground stems can be made into cuttings; but true root cuttings possess no buds whatever, the buds developing after the cutting is planted. Out of doors the blackberry and *Tecoma* vine can be readily propagated in this manner, and it is also used in greenhouses for *Dracanas* and *Bouvardias*, amongst a few others.

Plants which sucker freely can usually be propagated by root-cuttings, but in these cases the removal and planting of the rooted suckers amounts to the same thing. This comes under the head of propagation by division, and is the usual way of multiplying most species of hardy perennials. In fact with the majority of the latter one can obtain enough new plants by dividing the crowns in three or four years after planting a perennial border, to cover several times the original area of ground. Some of these, however, like *peonies* and *Anemone Japonica*, do best when left undisturbed, although they may be increased by division.

Propagation by leaf-cuttings is a method sometimes used with a few greenhouse subjects having fleshy leaves, the whole or portions of a leaf being treated as green-wood cuttings.

Propagation by specialized buds—so called—is another method which may be looked upon as really a natural mode of vegetative plant multiplication.

Specialized buds include bulbs, bulblets, corms and tubers; in propagating they stand in a sense intermediate between the use of parts intact, that is, by suckers, or division, and by cuttings. The bud which is to form the future plant is specially prepared by the parent through an abundant food supply and a partially dormant condition of the cell protoplasm, to maintain a separate existence, even under adverse conditions, and in due time to develop into a plant. In some respects it resembles a seed from which it differs, however, in the less dormant condition of its protoplasm and in not being the product of sexual fecundation.

A bulb is a very short stem containing a terminal bud enclosed in scales. The scales are thickened by the food stored in them and in their axis are smaller buds. The terminal bud usually develops a flower and then perishes, and one or more of the lateral buds may develop into flower buds for the following year, and thus continue the life of the plant. These thickened scales can be used for propagation.

Remove the scales intact and plant upright like seeds in a soil composed of equal parts of sand and leaf-mold. September is the usual month for the operation. A cool greenhouse or cold-frame may be used for the purpose, and young bulblets, not roots, will usually appear at the bottom of the scales before Winter; these bulblets will produce top-growth the following Summer, and they should be kept as cool as possible throughout the Winter and not forced into growth by high temperature. According to species, a greater or less number of years will elapse before flowers are produced.

Bulblets are naturally formed in the axils of the leaves on certain plants, as in the case of the Tiger Lily; or at the apex of the stem, as with the "top-onion." The bulblets of the lily may be collected when ripe and sown in a cold frame, or they may be carried over the Winter in paper bags and planted in the Spring, using light, rich soil.

Bulbs invariably break up, or divide themselves into two or more portions, each portion being a complete bulb. These portions may be taken and planted separately if desired.

A corm differs from a bulb chiefly in being without fleshy scales; familiar examples occur in the gladiolus and the crocus. As a rule, a new corm is produced each year above the old one and commonly bears flowers the following year. Also a number of little cormels appear around the base of the new corm. For the purpose of multiplication these cormels are saved and planted in rows like peas in the Spring. From these flowers will be produced the second year.

In the case of plants bearing tubers, of which the common potato is the most familiar example, there are some differences in the methods of vegetative propagation, which are caused by physiological differences in the tubers themselves.

With the above potato, as many new plants may be obtained from a single tuber as the latter contains eyes or buds, but a piece of tuber without an eye will not produce a plant. With the sweet potato the case is different. These tubers do not contain eyes and the usual method of propagation is to cut the tuber in half lengthwise and lay each portion flat upon moist sand, either over bottom heat or without, according to climate. Young plants will appear in about a month and these are pulled off when rooted and three or four inches high, and planted; others will soon arise to take their place, and thus three or four crops of sprouts may be obtained from each tuber.

The tubers of the dahlia do not give rise to plants under any circumstances, but new growth starts from the portion of the stem just above the tuber, therefore in planting care must be taken that each tuber has a portion of stem attached to it.

Tubers are, in practically all cases, merely thickened portions of a stem, and are really storehouses of food to support the young growth in its early stages.

Layering is a mode of stem propagation in which the shoot remains attached to the plant until rooted. Many plants naturally and habitually propagate themselves by means of decumbent shoots, which, becoming more or less covered by earth and leaves emit roots, generally at the nodes. There are also a large number

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Departments of Foreign Exchange and Book Reviews

DOUBLE WHITE NARCISSUS FAILING.

The so-called blindness in the double white Poet's Narcissus is a failing more or less prevalent each year, and is due to a variety of causes. The following are some of the essential details in the successful cultivation of this much-prized flower. It is a gross feeder, and therefore should be well manured. It prefers being planted deeply in the soil, not less than 6 inches, and preferably at 8 inches. A strong, almost tenacious soil is that most suited to its growth, development, and flowering. In light soils, in conjunction with shallow planting, it is usually a failure. The bulbs are impatient of removal, and especially resent being dried off. When replanting is contemplated, this should be done in July, if possible. The root-fibres of this kind are almost perpetual in character, and should be regarded in a common-sense view. Bulbs that have stood some time and flowered in the same spot have impoverished the soil, and failure is sure to follow. In such a case a Winter mulching of manure would be helpful. Too often this is where the neglect comes in, though quite unwittingly. It is not sufficiently recognized that by reason of its late flowering the Summer is approaching before the bulbs are fully ripened off. It is not generally known that the flowers that should appear in May of the present year are really formed and exist in embryo in mid-Summer in 1920. It is for this reason that every support should be accorded the bulbs, so that the growing season may be prolonged as much as possible, and thereby ensure the fullest development and the proper formation of the buds at this time. Not a few regard the "blindness," as this failing is called, as the result of the climatic or atmospheric conditions of the moment, but the true cause is more probably insufficient development in the previous year, as even though blind all the other parts may be good, and as such are produced by the bulb in its season. All you can now do is to encourage the most vigorous growth by mulching with manure and a good dressing of soot, and weekly applications of liquid-manure. Then at the proper time replant as directed in rich soil. In digging in the manure—cow-manure and soot are best if your soil is light—keep it 4 inches or 6 inches below the bulbs.—*Gardening Illustrated*.

THE BEARING OF FRUIT TREES IN ALTERNATE YEARS.

It is a fact well known to growers that certain varieties of Apple and Pear bear fruit only in alternate years. In some varieties the succession of lean and fat years is perfectly regular and a full or fair crop is followed by no crop at all. The meaning of the phenomenon is obscure. Some varieties do not exhibit this biennial habit, but bear regularly year after year. They have no "off" year. It is usually assumed that the lean year is the result of fatigue from over-fruitfulness, i.e., that the barrenness of the alternate years is the result of exhaustion brought about by the fruitfulness of the preceding fat years. There are grounds, however, for doubting the sufficiency of this explanation. No one denies, of course, that heavy bearing in one year is apt to be followed by light bearing in the subsequent year; but in the case of the trees with biennial fruiting habit the facts to be explained are less simple—an "on" year with only a moderate crop is followed by an "off" year with no crop at all. In such cases it is difficult to sustain the "exhaustion" hypothesis. Moreover, if exhaustion by reason of fruit production were responsible for this biennial fruitfulness, it would be expected that removal of the young fruits in a fruitful year would save the tree from the exhausting effects of fruit bearing and leave it in a state to bear a crop the following "off" year. This result is, however, not obtained and trees treated in this manner still retain their biennial habit. Nor indeed is this surprising when it is remembered that before thinning can be practised, that is, before the fruits are of appreciable size, the destiny of every bud on the tree has already been decided so far as fruiting in the following year is concerned. Thus, as is pointed out in the course of a valuable discussion of the subject of alternate bearing by Mr. R. H. Roberts, of the Wisconsin Experiment Station, each

bud on the spur and other shoots of an Apple has its destiny for the year fixed by early July. Those buds which by that time have not plumped up do not become fruit buds during that season, but remain either as vegetative or dormant buds. Hence it would appear possible that not excessive fruit formation but excessive flower and fruit bud formation is the immediate cause of the biennial habit. There appears to be some ground for this view, for it has been shown that by removal of the flower buds from the spur shoots the biennial habit is broken so far as those shoots are concerned, and that instead of failing to blossom, as they would otherwise have done, their deflowered shoots bloom freely in the ensuing "off" year. Those who are accustomed to distinguish between fruit and wood buds only by the naked eye will doubtless be surprised to learn that, according to Mr. Roberts, the one may be distinguished from the other by means of the microscope long before there is any outward and visible sign of difference between them. So early as the first week of July the blossom buds of next year may already be distinguished. These buds, of course, go on maturing and developing their blossoms during the Summer and Autumn months. But for the production of flower buds there is only a narrow margin of time between the beginning of Spring growth and the critical first week of July, after which no more blossom buds for the next year are laid down. If the energies of the tree during that time are fully concentrated on the development of blossom, it seems not unnatural that none should be left for the production of blossom buds for next year. The same idea may be expressed in terms of material if it be supposed that certain specific food substances are required for the production of blossoms; for it is easy to imagine that if all those materials are employed in the development of this year's blossom, none is available for the initiation of next year's blossom buds. That the state of nutrition of the tree has its effect on blossom bud formation is, of course, evident from general experience. It may also be demonstrated by removing the leaves from spur shoots about three weeks before the fruit buds would be visibly developing. As a result of the operation, blossom buds are not formed on the defoliated shoots. How the orchardist is to apply this knowledge is not easy to prescribe. He can, of course, refrain from planting alternate bearers, but whether he can, by manurial treatment, supply the raw materials for fruit bud formation and then break down the biennial habit is by no means certain. With trained trees the case is easier and alternateness of bearing may be prevented by the systematic removal in the "on" years of a certain number of buds as they are opening.—*The Gardeners' Chronicle* (British).

OLD OR NEW SEED.

It is, of course, a well-known fact that the capacity of seeds to germinate tends to decrease with age. In some cases germination capacity falls off very rapidly; in other cases it remains high for a number of years after the seed has been harvested. Among vegetable-garden crops parsnips afford an example of seeds whose germinating capacity soon deteriorates, even so short a period as one year sufficing to reduce the percentage of germination to a relatively low figure. Plants of the cabbage tribe, turnips, etc., retain their germinating capacity longer, but at the end of two or three years it will be found to have become less than it was in the year of harvesting. The seeds of peas and beans suffer less from the effects of keeping, and may give quite good results after three or more years. Needless to say, the power of seeds to retain their capacity to germinate varies not only with the variety, but also with the nature of the harvest and with the conditions under which the seeds are stored. A poor harvest year generally means in this country one in which seed does not ripen thoroughly; that is, does not dry off completely, and such seed generally shows a relatively low initial power of germination and poor "keeping" properties. Conditions of storage also affect the keeping properties of seed. If the air is either uniformly damp or subject to marked alternations of dampness and dryness, the germinating capacity falls off rapidly. That this is the case may be easily understood when it is remembered that seeds are very hygroscopic—that is, readily take up water when exposed to a moist atmosphere. It is, therefore, necessary if for any reason it is desired to keep seeds for a long time, to put them in sealed

bottles or jars, and to store them in a cool place. So sensitive are the seeds of some plants that even exposure to light may affect their powers of germination. It follows from what has been said that a good general rule is to sow seeds the year after harvesting. This rule, however, is one which admits of numerous exceptions. For instance, some seeds—e.g., primulas—germinate better if sown before they are fully matured than they do if sown after their fruits have completely ripened. On the other hand, it is an old belief that with some plants seeds of more than one year old give better plants than do seeds of the previous harvest. Thus a writer in the *Queensland Agricultural Journal* (XV, April, 1921) cites the belief often entertained by gardeners that two-year-old seeds of beet and carrot give better plants than are to be obtained from fresh seed. The same writer also states that three-year-old chicory and cabbage seeds should be sown, and that spinach, lettuce, and radish are less apt to bolt if grown from two-year-old seed. For our part we are inclined to be sceptical of the correctness of these opinions, and should certainly prefer to sow one-year-old, i.e., fresh harvested seed, in all these cases. The practice of an earlier race of gardeners of carrying melon seed for a year or so in the waistcoat pocket before sowing may, however, mean that in the case of this plant old seed gives better results than new. Another belief which would seem to be well founded is that the proportion of doubles may be increased in the cases of stocks and asters by sowing old seed. How ancient is this belief is illustrated by a citation, published in the *Revue Horticole*, from an old garden book of 1765, which runs: "Many amateur and professional gardeners are certain that stock seed kept for five or more years gives a larger percentage of doubles than does fresher seed."—*The Gardeners' Chronicle* (British).

ON TRANSPLANTING EVERGREENS.

Where shrubberies are in danger of overcrowding, and in many gardens where this is not the case, it will be under contemplation to remove to more spacious or more suitable quarters evergreen shrubs of some size. These will have in all probability not been transplanted for a number of years. The operation is one which, to command success, should be undertaken early in September or even, should we happily get good rains in the interim, at the end of August. Whatever care be taken, very considerable damage must ensue to the root action of such established shrubs, and the success attained in transplanting—equal care in removal and replanting being supposed—will be in direct proportion to the relative earliness at which it is undertaken. The only hope for such plants to re-establish themselves without grave damage rests in their wonderful ability to make new roots before the ground loses too much of its warmth. To anyone who has not previously seen it, the amount of root growth which a young Conifer will make in a single week if transplanted at the season mentioned would be a revelation. It behoves those who have specimen Conifers, Hollies, Rhododendrons or other evergreens which they purpose moving to see without delay that the sites to which they are to be removed are cleared clean, that any special compost is ready, and the necessary tackle to hand and in good working order. In the case of really large specimens it is wise heavily to root-prune the trees a twelve-month before the actual removal.

The question then arises as to whether a particular tree stands a good chance of surviving transplantation. It may be helpful to the inexperienced to know that large Rhododendrons and other American plants move readily, so as a rule do Hollies, if they have been properly and regularly transplanted as nursery stock. Of Conifers, *Abies*, *Picea* and *Pseudotsuga* usually move well. Cedars, too, usually transplant successfully, but they almost invariably cast their needles and to the casual eye look dead the following Summer. Most varieties of *Chamaecyparis* (*Cupressus Lawsoniana*) move fairly well, but the forms *erecta-viridis*, *alba spica* and *versicolor* are difficult unless they have been regularly and recently transplanted. The true Cypress (*Cupressus*), the Junipers, Tsugas, Sequoias and Pines are not worth attempting if they have largely increased in size since last transplanted. The *Arbor-vita* as a class move fairly well. Hollies, Yews, Rhododendrons and Sequoias should have first attention. They will not root in soil at all cold. This trying season will doubtless have made many converts to Autumn, but it is to be feared that it is still not fully realized what an asset the latent heat of the soil is in successful transplantation. The old idea about leaving Hollies, Rhododendrons and different Conifers until May still persists. The only objection to the early planting of even herbaceous plants and roses lies in the damage they are likely to sustain when closely packed for transit, and this will not apply where the plants are to hand.—*The Garden*.

DEPARTMENT OF BOOK REVIEWS

PRACTICAL TREE REPAIR.—By Elbert Peets; Robert M. McBride and Co., New York.—The best maintenance of trees is a matter of great importance from not only the material standpoint but also from the point of view of esthetics and hygiene. It is then very fortunate that there is available a book so complete, so sane and so reliably specific as is this. It is full of wisdom greater than is displayed the world over, with one reported exception, toward physicians: in parts of China, it has been told, physicians receive stipends for keeping people in good health. So this book rests upon the obviously sensible assumption that "tree surgery is not so important to trees as feeding, watering and spraying, and that the common-sense, as well as the scientific procedure, is first to make the tree vigorous and then, if it needs filling, to fill it." But it points out too how this is not always good economy, and sometimes not indispensable to the life and the best future growth of the trees. Other treatments of cavities, which the author's wide experience has enabled him to handle exceedingly well, are of greater importance than the mere filling of them. Emphasis is placed upon what might be called the work of the "tree physician," more than upon tree surgery. But the latter, when really scientific and really expert, is given full recognition and those who practice it should rejoice that there is such a book as this to direct in the preliminary treatment of cavities that makes their work more permanently valuable and to spread the conviction that the need of their work is greater than the supply of it.

Particular notes on the various species of trees and a bibliography increase the usefulness of the general treatment.

DOWNING'S LANDSCAPE GARDENING.—John Wiley and Sons, New York.—In this handsome volume are brought together the best portions of Andrew Jackson Downing's works relating to Landscape Gardening, by one who knew him well, as he knows the art well, from the epoch-making book "Landscape Gardening" and the rural essays published in *Horticulture*. It renders, quite obviously then, a great service, particularly in providing, for all students of the art, the means for a proper perspective, for Downing is admittedly the founder of American landscape gardening. In this respect the value of the book is enhanced by Mr. Waugh's calling attention to the lines of direct and immediate influence radiating from the great genius, and which have persisted, but also to present-day principles and practices divergent from those inculcated by the great master. But such handling is all in a reverent spirit; the main treatment makes vivid the original imprints. All the way through it is clear that the true philosophy of landscape gardening, according to Mr. Downing, is to make Nature serve man and that "the landscape should be lovely, and the house graceful and beautiful, and the fruit fine and the flowers perfect because these are all dependencies and ornaments of home and home is the sanctuary of the highest human affections." But at the same time, it should be noted, Mr. Downing was one of the first and ablest advocates of public parks also.

The book is inspirational; it gives increased dignity to the profession and the reading of it should enable the practitioner to avoid many vagaries that he might otherwise be prone to.

A LESSON ON VEGETATIVE PLANT REPRODUCTION

(Continued from page 708)

of plants which while they do not naturally propagate naturally in this way, can be increased more or less easily by this means. Sometimes the shoot is partially severed, preferably just below a node, before covering with earth, but it is generally sufficient to make a mound of soil sufficiently high to cover the bottom of the shoots four or five inches deep. In most cases a year is allowed to elapse before removing the rooted shoots.

The above is necessarily only a brief sketch of one portion of vegetative propagation. Almost every species has some special points which expert propagators have discovered by long experience, and to deal fully with the subject would require a book of some size. There is another portion of the subject worth considering, namely, grafting and budding, which we must leave for another lesson.

National Association of Gardeners

Office: 286 FIFTH AVE., NEW YORK

President—W. N. Craig, Brookline, Mass.
Vice-President—George H. Pring, St. Louis, Mo.
Secretary—M. C. Ebel, 286 Fifth Ave., New York.
Treasurer—Peter Duff, Orange, N. J.

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NEW SUSTAINING MEMBERS.

Anton G. Hodenpyl, Locust Valley, L. I., and E. L. Young, Glen Cove, L. I. (John Alexander, superintendent); Mrs. Bayard Thayer, Lancaster, Mass. (William Anderson, superintendent), have become sustaining members of the association.

NEW MEMBERS.

Alexander Grieg, Greenwich, Conn.; George F. Martin, Fairhaven, N. J.; John Tuenge, Weehawken, N. J.; John J. Jamgotch, John C. Munn, Jr., E. L. Munz, New York City; John Shivas, Tarrytown, N. Y.; Louis Lund, Tuckahoe, N. Y.; David McKenzie, Crestwood, N. Y.; Paul Jehanne, Tuxedo, N. Y.; Hans J. Hansen, Massapequa, L. I.; James Foulis, Sewickley, Pa.; John E. Kachel, Shillington, Pa.

ANNUAL CONVENTION

Park Avenue Hotel, Park Avenue and 32nd Street, New York, Oct. 11 to 14.

TUESDAY, OCT. 11.

- 11 A. M. Executive meeting of trustees and directors.
 2 P. M. Opening of convention. T. A. Havemeyer, president of the Horticultural Society of New York, chairman.
 Address of Welcome—Mrs. Samuel Sloan, president of the Garden Club of America.
 Response—
 President's Address—W. N. Craig, Brookline, Mass.
 Quarantine No. 37—A. C. Burrage, president of the Massachusetts Horticultural Society.
 Sign Board Nuisance Along the Highways—James Boyd, president of the Pennsylvania Horticultural Society.

School Garden Movement—Otis M. Eastman, supervisor of school gardens, Cleveland, Ohio. Discussions.

WEDNESDAY, OCT. 12.

- 9 A. M. Secretary's report.
 Secretary's financial report.
 Treasurer's report.
 Committee reports.
 Resolutions.
 New business.
 Consideration of next meeting place.
 Adjournment for luncheon.
 2 P. M. Nomination of officers.
 Unfinished business.
 Subjects for discussion—
 Training Young Men on Country Estates.
 Examinations for and Classification of Gardeners.

7 P. M. Annual banquet.

THURSDAY, OCT. 13.

- 8.30-9.30 A. M. Polls open for election of officers.
 Unfinished business.
 11 A. M. Automobile trip to Westchester County. Luncheon at Greystone, Yonkers, Samuel Untermyer's estate, and visit to other estates, including John D. Rockefeller's estate, Pocantico Hills.

FRIDAY, OCT. 14

- 9 A. M. Leave hotel in automobiles for visit to country estates in Nassau County, L. I. Luncheon at Engineers' Club, Roslyn, L. I.

GARDEN CLUB EXHIBITS

The Garden Club of New Rochelle is cooperating with the Westchester and Fairfield Horticultural Society in its Dahlia show for the benefit of the New Rochelle Hospital, which will be held at the Trinity Church Parish House, New Rochelle, September 21 and 22.

For twelve years the Short Hills Garden Club had an annual dahlia show. Each year they have raised its standard of merit and improved the general effect, until last year a number of men who have had much experience in shows were most enthusiastic in their praise. Mr. John C. Wister, president of the American Iris Society and secretary of the American Rose Society, said frankly that it was by all odds the most beautiful flower show he had ever seen.

For the past six years these shows have been timed to follow closely upon the heels of the show of the American Dahlia Society; and this year opens on Friday, September 30 at 3.30 P. M., remaining open the following day from 10 A. M. until 6 P. M.

The American Dahlia Society has offered its silver medal for the dahlia scoring the highest number of points. The Garden Club of America offers its horticultural medal for the most meritorious exhibit in the show. The Short Hills Garden Club medal goes to the finest seedling dahlia of 1921, and the Dahlia Society of California has offered its silver medal as grand prize.

A number of other prizes have been offered by individuals and competition will be very keen.

All amateurs, whether members of garden clubs or not, are invited to compete.

Mrs. Charles H. Stout, who is one of the founders and for several years an officer of the Short Hills Club, and probably has been the chief prize winner of practically every show conducted by the club, has announced that she has turned over her dahlias to Alt. F. Clark of Netcong, a professional, who will exhibit a large display of all varieties.

The Summit Garden Club will hold a Chrysanthemum show in the auditorium of the Young Men's Christian Association, Summit, N. J., on the 19th of October. The schedule will also include flowers other than chrysanthemums which may be in bloom outdoors at that time as well as those grown under glass.

Amateurs residing in New Jersey are invited to exhibit. They can secure a copy of the schedule of exhibits by addressing Mrs. John R. Todd, chairman of exhibits, 208 Summit Avenue, Summit, N. J.

All of the garden clubs of New Jersey have been invited to co-operate, and their members will be entertained by the Summit Garden Club during the show.

The proceeds of the show will be donated to the "Lest We Forget Committee."

The chairman of the various committees are, Mrs. Carroll P. Bassett, show; Mrs. John R. Todd, exhibits; Mrs. Allen B. Wallace, decorations; Mrs. Parker D. Page, floor; Mrs. William Hyde Wheeler, publicity; Mrs. Nathaniel B. Day, "Lest We Forget" booth.

The officers of the Summit Garden Club are, Miss Kate Somers, president; Mrs. Nathaniel B. Day, treasurer; Mrs. R. A. Wodell, secretary.

The Allegheny, Pa. Garden Club is cooperating with the Sewickley Horticultural Society in the Sewickley Dahlia show, to be held at Sewickley, Oct. 6 and 7.

The Garden Club of America will co-operate with the Horticultural Society of New York in its annual fall show to be held at the Museum of Natural History, Nov. 3 to 6.

OTHER COMING EXHIBITS

New Rochelle, N. Y.—Westchester and Fairfield Hort. Society Dahlia exhibition, Sept. 21 and 22. Oscar E. Addor, Sec'y., Larchmont, N. Y.

New York City.—American Dahlia Society. Annual exhibition Sept. 27 to 30, at the Pennsylvania Hotel, Sec'y., pro tem Wm. J. Rathgeber, 198 Norton St., New Haven, Conn.

Glen Cove, L. I.—Nassau County Horticultural Society. Annual Dahlia show, Oct. 4 and 5. Chrysanthemum show, Nov. 1 and 2. Sec'y., Arthur Cooke, Glen Cove, L. I.

Sewickley, Pa.—Sewickley Dahlia show, to be held by the Sewickley Horticultural Society, Oct. 6 and 7. Sec'y., George W. Kirk.

New York.—New York Horticultural Society. American Museum of Natural History. Annual Fall show, Nov. 3 to 6.

Morristown, N. J.—Morris County Gardeners' and Florists' Club. Twenty-fifth annual flower show. Oct. 26, 27, 28. Silver Jubilee show.

Tarrytown, N. Y.—Tarrytown Horticultural Society. Fall exhibition, Nov. 2, 3 and 4. Sec'y., E. W. Neubrand, Tarrytown, N. Y.

Philadelphia.—Pennsylvania Horticultural Society. Annual exhibition, Nov. 7, 8 and 9. Sec'y., David Rust, 606 Finance Bldg., South Penn Square, Philadelphia.

New York City.—American Institute. 90th annual exhibition. Engineering Bldg., 25-33 W. 39th Street, Nov. 9 to 11. Sec'y., Dr. J. W. Bartlett, 324 W. 23rd Street.

New York City.—Spring show, 1922, Grand Central Palace, March 13 to 19.

Cleveland, O.—Fifth National Flower show, March 25 to April 1, 1922. For particulars address John Young, Sec'y., S. F. A., 43 West 18th Street, New York City.

NEW YORK TO HAVE SPRING SHOW IN 1922

New York will have its regular Spring show under the auspices of the New York Florists' Club and Horticultural Society of New York, during the week of March 13 to 19.

AMONG THE GARDENERS.

Irving Schofield resigned his position as gardener on the D. S. Walton Estate, Llewellyn Park, West Orange, N. J., to accept a similar position on the Joseph Plant estate, Elmsford, N. Y.

John Shivas secured the position of superintendent on the Wilbur estate, Manchester, Vt.

Arthur Chandler accepted the position of gardener to Mrs. Armstrong, Belle Haven, Greenwich, Conn.

Oscar A. Springer resigned his position as gardener of the E. Twyeffort estate, Bridgehampton, L. I., and accepted the position of superintendent of the F. M. Leavett estate, Smithtown, L. I.

Walter Lee of San Francisco, whom the members of the association who attended the gardeners' conference during the Panama-Pacific exposition, will recall as taking an active part in it, paid a visit to the secretary's office recently on his return from Europe. Mr. Lee has gone back to the Pacific coast with the intention of organizing a Pacific coast branch of the national association at an early date.

JOHN LOW

John Low, superintendent of the Edward I. Cudahy estate at Lake Forest, died in the Alice Home Hospital on August 22, of burns received on July 30 when he saved the lives of Michael and William Cudahy, the nine- and seven-year-old sons of his employer. Low sacrificed himself in rescuing the two boys after an explosion of natural gas which was seeping up from a water pipe. The two boys were only slightly burned, but Low was scorched on his face, body and hands when he used his body to shield them.

Mr. Low came from Scotland 15 years ago, and has been with Mr. Cudahy most of the time since then. The Cudahy family is heartbroken over the sad affair, and all of them attended the funeral and will provide for the widow, Mrs. Margaret Low. Chicago papers gave some prominence to the affair, publishing a photo of the deceased, saying he was a hero in saving the lives of the boys without a thought for himself. He was 45 years old and is survived by a widow and two brothers, Alexander and William. The funeral was held Wednesday, August 24 from the First Presbyterian Church, Lake Forest, and was largely attended by the large estate owners and gardeners of that section.

"Greater love hath no man than this, that he lay down his life for his friend." So died John Low of Lake Forest, Ill., whose gallant, unselfish death, the gardeners of America and all members of allied horticultural trades can think upon with pride almost, if not quite, sufficient to reconcile them to his untimely departure. All honor to his name.—*Florists' Exchange*.

PROFESSIONAL GARDENING OPPORTUNITIES

Dear Mr. Editor: I am seventeen years of age, and I want to go into some outdoor occupation that will get me away from the routine of desk work, which I dislike very much. At the same time I want to be able to earn good money and have some standing. I am interested in scientific gardening. Would you advise me to take it up as a regular occupation, and can you give me an idea as to the best course to follow? LESLIE M.

Roanoke, Virginia.

Once upon a time a gardener was looked upon as an uncouth person, ignorant of everything except matters pertaining to his own particular line of work; but nowadays all that has changed. Gardening is a regular profession, just as much as law or medicine, and a great deal healthier and more useful, to my way of thinking. The modern science of gardening is not just a matter of putting around with a rake or pulling up weeds and tending a few pet flowers. It embraces a great deal of highly specialized knowledge, including horticulture, agriculture, animal husbandry, construction engineering, flower growing, and plant cultivation. Positions on big estates are open to the man well trained and proficient in the field, and the salaries compare favorably with those in professional and commercial life. The National Association of Gardeners cooperates with young men of your age and thereabouts who are desirous of making gardening their life work, and gives them opportunities of being apprenticed on estates where they can earn while they learn. Many of the most successful country-estate managers in the United States have acquired their experience in this manner. The association above mentioned has an office at No. 286 Fifth Avenue, New York City.—*Western Story Magazine*.

The foregoing brought many responses from young men anxious to take up gardening as a life work. The secretary will be glad to hear from any one that can offer a position to a young man on an estate where he may serve as an apprentice and receive the training necessary to fit him for the gardening profession. The number of responses made it evident that there are many young men keenly interested in gardening, and the association is desirous of placing them, if possible, on estates which are under the supervision of the members of the association.

INSTRUCTIONS FOR MEMBERS ATTENDING THE CONVENTION

Members who are planning to attend the coming convention, should arrange for hotel accommodations at as early a date as possible. Write to the secretary and he will engage rooms for you at the headquarter's hotel, the Park Avenue Hotel, which has named the following rates: Single room, without bath, \$2.50; with bath, \$4; double room, without bath, \$4 and \$4.50; with bath, \$6 and \$7.

Members must present a 1921 membership card to the secretary on their arrival for registration at the Park Avenue Hotel. They will then receive a program of the business and pleasure which is being planned for the visiting members.

Members who have any suggestions to submit to the convention, and who will not be able to be there personally, should address them to the secretary, so that he will receive them before October 5.

Annual Convention

National Association of Gardeners

Park Avenue Hotel, New York, October 11 to 14

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD (CONN.) HORT. SOCIETY.

The above society met on Friday, Aug. 12th, with President Henry Jones in the chair. All members spoke of the excellent time spent at the Annual Field Day held at Rye Beach on the 9th with the Tarrytown Society, thanks being accorded to W. J. Sealey for the arrangements for the dinner and Thomas Atcheson for the way in which he handled the sporting events.

Mr. Troy, manager of the dahlia show to be held on Sept. 21st-22d, encouraged us with his remarks regarding this affair and stated that he was determined to make it the greatest success of anything he had ever undertaken before. The publicity agents behind the exhibition are certainly doing their part and with good weather from now on there is no reason why the finest collection of blooms ever staged cannot be brought together. Only one more meeting now remains before the date of the show and it is hoped that all members will be in attendance. M. C. Ebel, secretary of the National Association of Gardeners will address us at this meeting regarding the formation of a local branch in this vicinity.

The committee on essays and lectures is arranging something that will be of interest to everyone for the coming meetings this Fall and Winter and it is hoped that all members will be present to benefit from the educational features that are to be adopted.

GEORGE HEWITT, Cor. Sec.

SEWICKLEY (PA.) HORT. SOC.

The regular monthly meeting of this society was held on Tuesday evening, August 9, with President Carman in the chair.

A communication was read from Mrs. T. H. B. McKnight, recently appointed editor of the *Bulletin* of the Garden Club of America, and who, incidentally, is a member of our society, offering a bronze medal on behalf of the Garden Club of America for the most meritorious exhibit by a club member. It cannot be won by a professional gardener. The medal will be offered at the dahlia show to be held October 6 and 7. The schedule committee reported that the work of the final schedule was under way, and that it would be ready for distribution about September 1.

HENRY GIBSON, Asst. Secty.

ST. LOUIS ASSN. OF GARDENERS.

The September outdoor meeting of the Saint Louis Association of Gardeners was held at the U. S. Entomological Laboratory, September 3d.

President G. H. Pring called meeting to order and after a short business session the writer was called upon to relate some of his observations during the Park Superintendents' Convention, at Detroit, Mich., where he visited all the parks and many private estates. This was followed by an extensive discussion on lawns and lawn making, led by Jack Baxter. Mr. Baxter stated that a light application of common dairy salt applied during the Winter when the ground was frozen to a depth of not less than one foot, would kill all weeds such as dandelions, and plantain without injuring the grass.

F. A. Satterthwait, the entomologist in charge of the Laboratory, then conducted the members through the establishment, showing specimen of such predacious insects as the billbugs, Hessian fly, chinch bug, etc., calling attention to their life and habits.

Mildew on Roses and on Grapes and Gooseberries



A Florist of repute tried it against other remedies on the Roses planted for an early crop of Commercial Flowers. The result was appreciation of the article which was called

HAMMOND'S GRAPE DUST

It is used from Long Island to California. It is simply dusted on the Plants. Our goods sold by the Seedsmen of America and won the Gold Medal at San Francisco World's Fair

Black Spot on the Leaves of Roses

This disease is one that seems to be well nigh universal wherever Roses are grown, although some varieties are more tender or less able to resist its inroad than some others. In our experience, on the banks of the Hudson and elsewhere, it develops more perceptibly during a spell of warm, humid weather, and this weather condition will quickly spread a few spots over half a leaf. The leaves first show a small black spot, which grows, and grows fast in a day or two of humid weather; and sometimes the leaves of a bush will drop off so as to be perceptible. A Moss Rose will sometimes seem to be struck with this trouble when a more common kind will show less. This Black Spot, which is called "Actinonema Rosae," grows in the tissue of the leaves, and where Roses are grown, whether outdoors or in large or small greenhouses, this trouble is apt to occur.

In treating Roses for Black Spot, the remedy, to be effectual, needs to be used early. For years it has been demonstrated that

HAMMOND'S COPPER SOLUTION

IS A RELIABLE PREVENTIVE REMEDY. After the leaves have started, syringe or spray the bushes with the diluted solution. And this care may need to be taken two or three times during the season. And in a greenhouse, as a preventive measure, spray the soil in which the Roses grow. The Rose Rust is a trouble which affects hardy Roses more than some of the more tender varieties, and the very use of the COPPER SOLUTION as a preventive remedy for Black Spot has the effect of checking the Rose Rust.



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READ OUR PAMPHLET

AMERICAN ASSOCIATION OF PARK SUPERINTENDENTS

The American Association of Park Superintendents held its twenty-second annual convention at the Hotel Tuller, Detroit, Mich., Aug. 23 to Aug. 25. Some of the proceedings of this convention may be of general interest to gardeners. Papers were read as follows:

"Essentials of Organization," A. A. Fisk, Chicago, Ill.

"Conservation of Wild Life," R. E. Follett, Detroit, Mich.

"Care of Street Trees," C. E. Smith, Detroit, Mich.

"Playgrounds," C. E. Brewer, Detroit, Mich.

"Value of Parks to Posterity," L. P. Jensen, St. Louis, Mo.

"Parks as Memorials," O. W. Douglas, Chicago, Ill.

"Woods as Parks," Dr. Filibert Roth, University of Michigan.

"City Planning in Relation to Parks and Boulevards," T. Glenn Phillips, Detroit, Mich.

These papers will be published in the official organ of the association *Parks and Recreation*, and are all of general interest. Resolutions were passed endorsing the Billboard Campaign of the National Association of Gardeners. The National Botanic Garden at Mount Hamilton, D. C., advocating that the shores of lakes and large streams be acquired for park purposes, the preservation of woodlands and the establishing adequate areas around every school-house for plantations and recreation.

A committee for the conservation of wild life was suggested and will likely be appointed. A committee was also appointed for the education of young men for the profession of Park Executive. In accordance with reorganization plans the name of the association was changed to the American Institute of Park Executives and The American Parks Society. All members will receive the magazine *Parks and Recreation*, which will be issued bi-monthly. Any one interested in park work may become a member of the Parks Society.

The following officers were elected: President, George H. Hollister, Hartford, Conn.; vice-president, C. A. Bossen, Minneapolis, Minn.; Secretary-treasurer, Emmet P. Griffin, East Saint Louis, Ill.

Directors: to serve one year, H. W. Busch, Detroit, Mich.; Theodore Wirth, Minneapolis, Minn.; to serve two years W. H. Dunn, Kansas City, Mo.; John Meisenbacher, Tulsa, Okla.; to serve three years, L. P. Jensen, Saint Louis, Mo., George A. Parker, Hartford, Conn.

Minneapolis, Minn., was chosen for the next meeting place of the convention.

The second afternoon and the third day were devoted to inspection of the parks and boulevards of Detroit.

THE QUESTIONNAIRE

Subscribers are invited to make free use of this department to solve problems that may arise in their garden work. Questions on the ordinary pursuits of gardening, that can be readily answered by applying to the usual reference books should not be referred to the Questionnaire.

What care should be given poinsettias to have them retain their leaves? Conditions at present are: Plants out of doors in partial shade; watered once or twice daily as per condition; sprayed with Black Leaf 40, dissolved Ivory soap one ounce, once a week or ten days. Ap-

parently free of insects.—E. H. K.—New Jersey.

A sudden change of temperature, or over-watering, will cause leaves to fall off the plants. By careful regulation of the temperature and by not over-watering, one can prevent the plants from losing their leaves. Poinsettias should be watered only once a day, as they are dry plants. They should be moved into a greenhouse and partly shaded until the plants can stand the strong sunlight, after which the shade should be removed. Poinsettias are tropical plants and should not be grown in the shade. As you have had your plants in the shade you must bring them into the sunlight gradually. Unless the plants are weak they are not subject to disease. An occasional application of Black Leaf 40 (one ounce to a gallon of water) will keep away the mealy bug which is the only insect that affects these plants.—EDITOR.

I am sending herewith some samples of delphiniums. Can you tell me what the trouble is and what I can do for them? My delphiniums are mostly young plants, although I have some that are three years old. The blossoms came out in clublike bunches and all mixed with green as in the sample. Among more than fifty plants there were not a half a dozen perfect ones. I do not think the white or the Chinese plants were at all affected.—Mrs. O. G.—New York.

In answer to your question regarding delphiniums, one of our contributors has written us that he believes that your plants have grown too fast, or have been given too much shade. As a rule, delphiniums are not subject to any deformity in color. As he is not familiar with the exact variety of delphiniums which you grow (your sample being so withered on its arrival that we could not examine it very carefully) he cannot give you a very definite cause of the trouble. It may also possibly be due to the fact that too strong a fertilizer has been used in the ground.—S. M. K.—Ohio.

Will you tell me when I should transplant perennial seeds? Should it be when they are large enough, or must I wait until Fall for such plants as Canterbury Bells and Digitalis?—Mrs. W. E. Derr, —Pa.

Perennial seeds of Canterbury Bells and Digitalis should be sown in July and trans-

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planted as soon as they can be carefully handled, two and a half to three inches apart in hot beds. The hot beds should be protected by sashes during wet season, especially for Canterbury Bells as their foliage is heavy. Damping is more often the cause of trouble than is frost.—H. M. —N. J.

Here and There

USEFUL EDGING PLANTS.

Away from the formal garden with its prim grass-edged walks the paths in the wild garden, the Rose garden, and the kitchen garden are never more pleasing than when bordered on either side with plants of a dwarf habit. Despite those of recent introduction, none are more fitted for our purpose than the well-known older kinds, because there is no question of their hardiness, and the majority are far from being fastidious in their requirements. Near path sides the soil, for obvious reasons, is never so rich as that further away, but this rarely has any ill-effect on well-chosen kinds. At this season, though the beauty of the old border Pinks is on the wane, their beauty is still fresh in the memory, while for their fragrance they are esteemed wherever plants are cultivated. In common with other interesting subjects there are varieties, the result of much careful labor, that bear little comparison to the original type, but for permanent edging I shall for some time yet cling to those that bear the moderate-sized flowers, because they hold themselves more erect than do many of the newer varieties. It is possible that in the near future we may find the new hybrids, the result of a cross between one of these Pinks and the Perpetual Carnations, a valuable addition for our purpose, because there is no doubt they have a future before them in the outdoor garden. Secondly only to the Pinks are the Aubrietias, unrivalled as they are for a mass of color in their season. One never minds these plants trespassing on to the pathway, as they are never so charming as when irregular in their outline. Where rough stones are used to edge the walks then Aubrietias are seen at their best, for it is surprising how quickly they ramble over them, and the effect is even more pleasing than when they are used in the ordinary edging style. This also applies to the single *Arabis alpina*. In Spring it never fails to produce a neat profusion of flowers, rivaling snow in their purity. Neater in appearance and flowering throughout the Summer we have in *Armeria vulgaris*, popularly known as Thrift, one of the best edging plants. Kept to small tufts they are models of compactness, or, if so desired, they may be allowed to run together and form one continuous line of refreshing greenery which is only relieved by the pink flowers in Summer. Everyone knows, and most of us take more than ordinary interest in Lavender, but how seldom do we find it only in some out-of-the-way corner in the flower border. The common form, admittedly, could only be used as an edging to a very wide pathway, but this cannot be said of the dwarf varieties.—*Gardening Illustrated*.

HORSECHESTNUTS.

Many Horsechestnuts and Buckeyes are now in bloom in the collection of these trees and shrubs on the right hand side of the Meadow Road. Of the European Horsechestnuts (*Aesculus hippocastanum*) it is not necessary to speak, for one of the most splendid trees in the world it is known to all

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THE AMERICAN BOTANIST
Joliet, Ill.

American tree lovers, at least in the northern and eastern states, where it has been growing for more than a hundred years, and noble specimens can be seen in Salem, Massachusetts, and other seaboard towns. The red-flowered Horsechestnut-tree (*Aesculus carnea*), with flowers which vary on different trees from flesh color to red, is supposed to be a hybrid between *A. hippocastanum* and one of the American red-flowered species, probably *A. Pavia*, which originated in Belgium many years ago. The handsomest of these hybrids, that is the one with the darkest red flowers, was raised in France and is known in nurseries as *A. Briottii* (*A. carnea* var. *Briottii*). There are small but well flowered specimens of this variety in the collection. Of the American species, the first to bloom is the form of the Ohio Buckeye, on which the leaves are composed of seven instead of five leaflets (*A. glabra* var. *Buckleyi*), a rare tree most abundant in Jackson County, Missouri. The flowers on the typical *A. glabra* open a little later, and are followed by those of the variety from southern Missouri and Arkansas (var. *leucodermis*), distinguished by its smooth, pale bark. The largest trees in the Arboretum of the Ohio Buckeye are on the left hand side of the South Street Gate and are still covered with flowers. The yellow-flowered *A. octandra* of the southern Appalachian forests is now in bloom. Hybrids of this tree and *A. Pavia*, first raised in Europe more than a hundred years ago, to which the general name of *A. hybrida* should be given, are conspicuous from their red and yellow flowers. A number of these hybrids are now flowering in the collection and show much variation in the size and habit of the plants, and in the size and color of their leaves and flowers. *A. georgiana*, the common Buckeye of the southern Piedmont region, which is sometimes a shrub and sometimes a slender tree up to thirty feet in height, with flowers in crowded clusters, red and yellow on some plants, bright red on others and yellow on others, shows again its value as a garden plant here at the north. Even more beautiful are the scarlet flowers of another southern plant, *A. discolor* var. *mollis*, one of the handsomest of the American plants introduced into the gardens by the Arboretum.

—*Arnold Arboretum Bulletin*.

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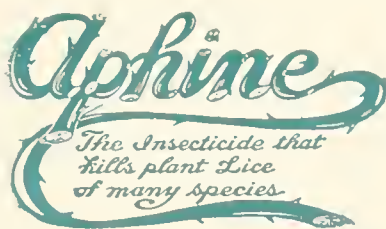
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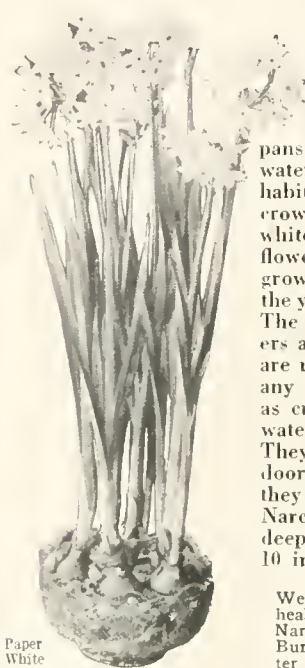
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

OCTOBER, 1921

No. 10

Things and Thoughts of the Garden

MONTAGUE FREE

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GARDEN

MANY of the large estates and former show places of England have greatly deteriorated from their pre-war excellence; but one at least, Aldenham House Gardens, seems to be fully up to standard and exhibits examples of high class gardening throughout the whole of its pleasure grounds of two hundred acres. We were privileged to spend rather more than half a day in the inspection of the treasures of these famous gardens and at the close of our strenuous peregrinations—it was a day of intense heat seldom equalled in England—we fully agreed with our cicerone in his statement, that it was necessary to devote at least a week to Aldenham to obtain a proper conception of its manifold beauties and the variety and extent of the collections.

Aldenham House is the country home of the Hon. Vicary Gibbs whose name is perhaps as well known in this country as it is in England in circles whose interests lie amongst rare trees and shrubs. He has done a great deal towards bringing to the notice of the public the value of many of E. H. Wilson's Chinese trees and shrubs by growing them at Aldenham and exhibiting them at the Royal Horticultural Society's shows. Much of the beauty of these famous gardens is traceable to Mr. Gibbs' designs carried out under the direction of the head gardener, Mr. Edwin Beckett, who is known throughout the country for his skill, particularly when it comes to the production of vegetables of superlative excellence.

* * *

Although practically all phases of gardening are represented at Aldenham one hears it spoken of chiefly in connection with its wonderful collection of woody plants and its remarkable kitchen gardens. Our guide, in response to a question as to the number of trees and shrubs cultivated, stated that "Aldenham challenged Kew in this respect," and that "the number of species and varieties was around ten thousand." This latter statement, we are inclined to believe, needs a grain or two of salt to make it palatable. Prof. Sargent, writing in Bailey's "Cyclopaedia," says that "At Kew is to be found probably the largest number of species of trees and shrubs which has yet been gathered together, for in England more plants can be made to grow together than flourish in any one country on the continent of Europe or in any one place in the United States." In the "Kew Hand List of Trees and Shrubs," published in 1902, the number of species of trees and shrubs cultivated there is given as

three thousand. It is scarcely possible, even allowing for the numerous new species of trees and shrubs introduced by Wilson and others during the two past decades, that the number of woody plants capable of cultivation outdoors in England has been increased to the extent of six or seven thousand.

It is perfectly safe to say, however, that no other private arboretum can boast of so large a collection, and probably no arboretum, either public or private, has a collection so well cultivated and cared for. Every tree and shrub on the estate is kept pruned so as to maintain shapely specimens and, in the case of flowering subjects, to promote floriferousness. Many perhaps, we amongst the number, would contend that at Aldenham pruning is carried to excess—that there is more charm in most trees and shrubs when to a large extent they are allowed to grow untrammelled by knife, pruning shears, or saw. Manicuring may be a good thing applied to the formal beds of the parterre, but it does seem a little out of place when applied universally throughout the whole of an estate.

* * *

It is seldom that one sees shrubs planted on the same gigantic scale as they are at Aldenham. Here one may see immense groups of such subjects as *Spiraea*, *For-sythia*, and *Exochorda* containing hundreds of specimens, but restricted to one species or variety. Some of these groups are said to cover an acre or more. Although so many plants are massed together, yet they are not neglected, for each specimen is kept properly pruned and is allowed room to develop. These enormous masses of shrubbery, displayed in beds of irregular and graceful outline, must be of surpassing beauty when in full bloom.

Near the ornamental lake of ten or more acres special efforts are made to ensure shrub plantings of such a nature that there is something of beauty and interest at all seasons of the year. Such plants as *Cornus sanguinea*, and the red and golden barked willows are used to provide color in the Winter. These, of course, are pruned severely before growth starts in the Spring, to promote the formation of strong young shoots which are more highly colored than older wood. Incidentally another plant that is here treated in this way, though not with the same object in view, is *Paulownia imperialis*, or *to-mentosa*, to use the approved though less familiar designation. This is cut back to encourage the production of those sucker-like shoots clothed with enormous leaves of

much value where a bold, subtropical effect is desired.

The use of shrubs at Aldenham in the make up of what might be described as Brobdingnagian carpet beds is perhaps unique. One example that created a rather favorable impression was composed of a center of innumerable plants of the purple leaved *Prunus Pissardii* bordered with a silvery margin of *Cornus alba*, var. *Spathii*. Repeated shearings at a height of about two feet above ground level had promoted the formation of a mass of foliage so dense as to be comparable only with that of a well maintained carpet bed. The golden leaved privet was another shrub subjected to this treatment.

* * *

The herbaceous borders exhibit a pleasing layout and at the time of our visit were gay with perennials in many varieties. These borders bisect one of the vegetable gardens (of several acres in extent) in two directions, forming a cruciform arrangement. The lengthy vistas that these borders present is partly broken and the eye arrested by an ornamental rain gage set in a small pool at the intersection of the walks. A pleasing foil to the bright colors of the perennials is provided by a background of dwarf apple trees in splendid condition, and there is an informal edging of rocks disposed in alternate bays and promontories amongst which alpinists and dwarf rock plants revel. The rock garden at Aldenham is small and not at all commensurate with the size of the place, but for all that a large collection of alpinists is maintained either in pots or pans or, as just described, as an edging to the perennial borders.

In another part of the garden a wide border of herbs opposite a planting of material with grey foliage provided a rather unusual display. In the latter planting free use was made of such subjects as lavender and *Artemisia*. Their quiet tones and subdued effect were enhanced by a gorgeous and brilliant background of hollyhocks. These were Vert's "Double Strain" and comprised the finest varieties and best grown specimens we have ever seen of this favorite border plant.

The hardy fern border may be considered as one of the features here. It is located on the north side of a wall and contains about a hundred and thirty varieties. The inspection of this border and the collection maintained at Enfield by Perry's Hardy Plant Farm served to remind us that hardy ferns received but scant attention at home and that their possibilities for garden service are far from being realized.

* * *

Another important feature at Aldenham is the border of hardy Asters, or Michaelmas Daisies, as the English prefer to call them. This occupies an area that we estimated to be about three hundred feet long and thirty wide. Individual plants are spaced so as to stand three or four feet apart, and only three or four shoots are allowed to grow from each plant. Of course, they were not in bloom at the time of our visit, but we saw a colored lantern slide which gave an idea of the wonderful display made by these Asters, which, by the way, were developed mainly from our native species.

The soil of this border was prepared by trenching it to a depth of three feet. This fact is sufficient to account for the differences to be noted in the height of certain varieties as recorded in American catalogs and in the Aldenham list. Many new varieties have been raised and introduced by Mr. Beckett in recent years. One set of about twenty varieties belonging in the *Novi-Belgii* section is reputed to be very fine. These have received names that commemorate places and persons brought into prominent notice by the Great War, such as "Mons," "Ypres," "Namur," "Nurse Cavell," "Captain Fryatt,"

and "Cardinal Mercier." For the benefit of those who may require further information concerning some of these new Asters it may be mentioned that the Rev. Joseph Jacob described quite a number of them and reported on their merits in *The Garden* (England) of December 11, 1920.

* * *

Apart from the fruit under glass the only indoor subjects that call for extended notice are the fine strain of *Streptocarpus* for which these gardens have long been famous, and a large collection of *Pelargonium* species, of which the scented leaved varieties form a large part. These were in former times universally popular, but nowadays they have fallen into undeserved neglect. The value that Mr. Beckett places upon one variety, *Pelargonium crispum variegatum*, as a garden and pot plant is shown by the large number that he grows both in standard and bush form. It is of erect growth with stiff stems plentifully supplied with crinkled leaves having a well defined silvery margin and is valuable as a pot plant and also for bedding. Not the least of its attractions is its delightful citron-like odor. This variety was awarded a First Class Certificate by the Royal Horticultural Society in 1919. Its history is interesting as showing the reaction of a committee in charge of awards to the merits of a given plant when shown at different times. Mr. R. H. Legg, of Melksham House Gardens, writing in the *Gardener's Chronicle* (England), August 30, 1919, says "the sport originated in these gardens in 1912. . . . In 1915 I showed six good plants at Chelsea, but apparently it was not then recognized as of any value, as no award was received for it." A large group shown by Mr. Beckett four years after received an F. C. C. as above reported.

* * *

The excellence of the vegetable gardens is sufficiently indicated when we record that Mr. Beckett has been awarded somewhere around twenty gold medals for displays of vegetables at the various big shows. Here, as elsewhere on the grounds, nothing is neglected that would serve to bring about a super-production—ground trenched three feet deep, ample supplies of fertilizer and plenty of room for the development of perfect specimens.

Whilst on the subject of vegetables we should mention that when passing an onion patch of the variety "Ailsa Craig" our guide was moved to tell us a story of a Californian visitor, which may be worth retelling as illustrating the ability of the American in holding his own. This particular visitor was proudly asked, when looking at a bed containing bulbs weighing two or three pounds, "Do you grow onions like that in your country?" and received the astounding reply, "Well—yes, our *small* ones run about that size—that's the kind we use for pickling." We surmise that the endeavor to visibly impress the Californian was then and there given up as a *ba'd* job.

It was impossible to avoid making comparisons of the methods used and results obtained in this garden, and in the typical American garden. For example—at Aldenham rooted cuttings of shrubs are potted separately and the pots stood (not plunged) on ashes in cold frames with plenty of space between each pot. Nothing very remarkable in that, but when we see frame after frame filled with shrubs in four and five-inch pots and are told that they are all watered from a watering pot it makes us marvel. It must be admitted that these hand-raised and spoon-fed plants have the edge on those reared by our slap dash methods, but whether the improvement in the product is sufficient to warrant the extra labor is another matter.

(Continued on page 727)

Vegetation and the Cold

WILLARD N. CLUTE

THE contention of the "oldest inhabitant" that the Winters are not as cold as they used to be is undoubtedly correct, though it is not likely that he knows any more about it than the rest of us. There is very positive evidence that the temperature of our globe has been much lower than that experienced by any living man, but the changes that take place in climate are so slow and so gradual that they cannot be perceived in a single lifetime, or in many lifetimes, for that matter. It seems certain, however, that this old earth has been frozen up and thawed out, not once but many times, and it has been dried up and moistened and dried up again.

It is not very far back to the last period of refrigeration as geologic time is measured. A matter of thirty thousand years or so would take us to a period when the most populous part of North America was buried beneath a great ice-sheet a mile or more in thickness. The southern edge of this stupendous glacier reached in some places to the Ohio Valley while its western border was in the vicinity of the Missouri river. There were also other accumulations of ice in the Rockies and along the Pacific Coast.

The long period of cold that preceded the last glacial period naturally killed all plants over a vast area and the ice that followed blotted out the evidence of their former existence with a thick sheet of sand, clay and gravel derived from the rock refuse ground up as it slowly moved over the land. It is evident that the onset of the cold was gradual for though the plants were killed, vegetation as a whole had time to migrate southward before the advancing ice. We still find stranded on mountain tops, far from the Pole, remnants of that Arctic flora which pushed forward in those troublous times and for some reason failed to return when the seasons were more propitious. One can imagine a long series of years each colder than the last until the ice of one Winter merged with that of the Winter following thus laying the foundation for the vast accumulations of ice that were to follow.

When a milder period dawned, the ice probably disappeared as slowly as it came. It has not yet entirely given up the struggle and still persists in the interior of Greenland. Nor was its banishment from our own region accomplished without many a stubborn battle between the forces of the sunshine and the frost during which the battle ground was over-run again and again. In Illinois there are indications of no less than seven separate invasions of the region by the ice. Whenever the ice melted, plant life pushed into the area uncovered and the birds followed. Many people see in these migrations back and forth, the origin of bird migrations in general. It is not possible for man to predict with certainty another glacial period, but we know that there has been more than one and that at the present time we appear to be living in a warmer period between what will prove to be successive glaciations.

Before the last glacial period, the climate was much warmer than it is at present, for palms and tree ferns, as well as many plants of temperate regions, grew as far north as Greenland, Spitzbergen and Nova Zembla. In fact, plants were so abundant in those regions as to form seams of coal thick enough for profitable mining. The area is now occupied by vegetation of a very different character whose origin the scientist is often puzzled to account for. It is commonly assumed that the plants of the present originated various devices to protect them-

selves from the cold and thus equipped pushed into the borders of the glaciated region and slowly penetrated to their present homes. A similar origin of desert plants is usually accepted. All such are supposed to have evolved means for surviving great drouth and thus have been able to penetrate to the most arid regions.

The criticism that may be brought against such theories of the origin of the protective structures of plants, is that they are supposed to have appeared in the plants before they were useful to them. It is quite apparent, however, that this would not likely be the case. A much simpler explanation, and undoubtedly the correct one, is easy to find and the phenomena of the glacial period give plausibility to it. When the cold of the glacial period began to be noticeable, the palms and ferns would succumb at once, but the hardier plants of the temperate regions, being less susceptible, would linger on and only give up the fight after long struggle. Time after time the tender shoots must have been killed or the whole plant cut down to the ground, until they were taught to turn their tips into buds and their leaves into bud-scales. Those killed to the ground developed the underground or geophilous habit which is now illustrated by a multitude of bulbs, tubers, corms, and rhizomes. Many species undoubtedly perished before they could acquire a protective covering, but the successful ones, of course, continued to reproduce their kind, steadily becoming better adapted to the conditions. In a similar way, desert plants appear to have adapted themselves to drouth conditions. Those that failed to do so perished when the region became too dry. If the change be only gradual enough, it is likely that the majority of plants can adjust themselves to greatly changed conditions. The desert made the cactus plant; in the Old World where there are no cacti, other plants have taken on their characteristic forms in response to similar conditions. Annual plants are plentiful in both Arctic and desert regions. Here we have a very different reaction to inhospitable conditions. Dying has become an adaptation for avoiding both cold and drouth, but before dying, the plants leave behind peculiarly resistant parts of themselves (which we call seeds) that spring up in a milder season to reproduce their race.

A peculiar effect upon the distribution of plants since the glacial period, has been produced by the configuration of the earth. North America has a much greater variety of trees than has similar parts of the Old World though from the evidence of fossils we are forced to conclude that before the glacial period Europe was in no respect deficient in such vegetation. When the ice invaded northern regions, however, the American species were able to escape by moving southward, but in Europe the escape of the vegetation was cut off by high mountains extending across their path and they consequently perished.

Non-effectiveness in life is not so much a misfortune as it is a positive and definite fault on the part of the individual. The man who is always dawdling along a journey and never arriving at his destination needs an absolute reorganization of his life. Now to a very great degree the non-effective person accepts his defeats and failures as a part of the established order of things, when in reality, they are just as entirely his own fault as would be falsehood or any other sin. One has simply no moral right to be non-effective.—*Lilian Whiting*.

The Virginia Creeper and Poison Ivy

BERTHA BERBERT-HAMMOND

THE Virginia Creeper (*Ampelopsis quinquefolia*) or American Ivy, is one of the most useful and rapid growing hardy native vines. In a comparatively short time its dense growth will beautify a porch, wall, fence, tree stump or any other object. Though the vines thrive in sunshine, they will also do well in a shady location, and so are valuable for growing on the north side of buildings. This reliable vine, which seems quite free of pests is easy to propagate from seeds, cuttings or divisions of the root. Young plants are readily transplanted and established, and after the first Winter require no protection.

The Virginia Creeper bears small greenish-yellow flowers which later develop into dark blue clusters of berries. In the Autumn the foliage assumes a gorgeous red coloring that is quite lasting, wonderfully attractive and universally admired. Writing of this vivid, beautiful autumnal transformation, Marion Howard says:

The Garden wall is a burning pyre,
And the vine once so green is crimson fire;
Kingdom of emeralds, all has been pawned,
For that vivid flame from Autumn's wand.
Who was the broker? Where is the crown?
Who sold the dye that colored the gown?
Genii or Witch, appear and confess
Why you crimsoned the green of the Ivy's dress.

At this season of the year when city visitors delight in woodland rambles and in the gathering of the late wayside flowers and attractive foliage, a word of caution in regard to confusing the beautiful red foliage of the Virginia Creeper, or American Ivy, with that of the dreaded Poison Ivy (*Rhus toxicodendron*) which it somewhat resembles, may be of service. This seemingly harmless vine, which is quite generally distributed over the United States, and very common in sections where there has been little effort to keep it from spreading, goes gayly gallanting over wall and fence, covering ground, stump, tree, or anything it may utilize as a support, with its rank growth. In the Fall the foliage becomes beautifully colored, and persons not familiar with the distinguishing features, mistaking the poison ivy for the Virginia Creeper, are lured into picking the graceful festoons of this treacherous vine, and by so doing are subjected to the exceedingly unpleasant and uncomfortable effects of ivy poisoning, for to the majority of persons mere contact with any part of this baneful plant is sufficient to cause a poisoning which manifests itself soon in a severe irritation of the skin causing a swelling, blistering and almost unendurable itching. If immediately upon contact with the poison ivy, the affected parts are washed with laundry soap and quantities of running water, or in strong hot soap suds, the irritation may be counteracted to a considerable degree. A solution of 20 grains of sugar of lead to a half pint of water may be applied after the little blisters have appeared, but this remedy being poisonous must be used with care. Peroxide of hydrogen is also effective. Such simple remedies as an application of a soap and water plaster, baking soda and vinegar, dry starch, etc., will usually afford relief if they are promptly used after contact. Delay makes a cure more difficult to accomplish.

A plant with such harmful, poisonous properties should

not be allowed to spread, and on many estates and farms, systematic efforts are made to eradicate this vine that endangers those who unwarily come in contact with it.

A number of plants of the Virginia Creeper that artistically draped my stone walls have been destroyed because they were found entwined with poison ivy that had stealthily established itself. Individual and organized effort to exterminate the plant should be made.

An effective way to eradicate this undesirable vine is to have some person, who claims immunity from its infection, grub its roots out of the ground and destroy them. When this cannot be done various spraying solutions may be used. There are a number of commercial solutions that play havoc with the poison ivy, like arsenate of soda or carbolic acid mixtures, but where there are pets or live stock these are rather dangerous agents. A safe home-made spraying solution to use is a mixture of common dairy salt and water in the proportion of almost two and one-half pounds of salt to a gallon of water. If the vine is repeatedly treated with this solution, or with kerosene, it will eventually be destroyed.

As its general resemblance to the harmless Virginia Creeper often deceives those who do not know the difference between these two vines, persons who frequent the country side should for their protection become acquainted with the distinguishing characteristics. The poison ivy bears a shiny three parted drooping leaf on the end of a long slender stem. The central leaflet of the trio has a stem a little longer than the other two. The margins of the leaflets vary, but if toothed are rounded or blunt. The berries are white and of a waxy texture. On old vines of the poison ivy an additional distinguishing feature is the hairy looking covering of dark fibres that are found enveloping the vines from the ground up to the newer shoots. The leaves of the Virginia Creeper are usually five-fingered, more firm and flat, with conspicuous veining and ribs that terminate in rather sharp marginal points, like the teeth of a saw. The berries, though much smaller, are grape-like in form and color, but they are not edible.

OUR COVER ILLUSTRATION

THE illustration on our front cover, reproduced from a photograph through the courtesy of John Scheepers, Inc., shows the exhibition of Judge Marean dahlias at the American Dahlia Society Show, held on the roof garden of the Pennsylvania Hotel, New York City. Judge Marean's dahlia creations have again asserted their superiority at the recent dahlia exhibitions throughout the country, in California, Denver, Pittsburgh and New York, and in other localities. "Marean" dahlias have stood head and shoulders above and beyond all other varieties in the garden as well as on the exhibition table. They are unquestionably the most beautiful and finest dahlias in cultivation today, from which further magnificent productions, from year to year, may be expected.

When deciding to secure some of these magnificent varieties so as to win the Blue Ribbon at your local dahlia exhibitions, you will find it advisable to reserve your tubers direct from the exclusive introducers, John Scheepers, Inc., 522 Fifth Avenue, New York City. The stock is limited; only the actual surplus of Judge Marean's ornamental gardens is available, shipped direct to you under his personal supervision.—Adv.

Arabis — Aubrietia

RICHARD ROTHE

BOTH the genus *Arabis* and the genus *Aubrietia* are members of the large order *Crucifer*. The species we are chiefly interested in, being inhabitants of the mountainous sections of Central and Southern Europe, have a low trailing, or in some instances tufted cushion-like growth in common. Noted for their very early and free-flowering habits they rank among our handsomest harbingers of Spring enjoying nationwide popularity.

Arabis albida and the more robust growing *Arabis alpina* have been used for edging purposes in gardens for over a century. Naturalized within thinly wooded sections their snow-white sheets of blossoms are vying with the bright blue of scillas and crocuses and the yellow of *Adonis* and *trollius* in conveying cheerful greetings to mankind weary of long dreary Winters. Of late the double flowering form of *Arabis albida*,—*albida fl. pl.*—and the much improved floral displays of *alpina grandiflora superba* have been instrumental in reviving the interest of many garden owners in the rock-cress.

For the enhancement of a charming color gayety in open sunny rockgardens and for dry wall plantings the dense sheets of bright lavender pink and purple blossoms of aubrietias are well nigh indispensable. Most of the forms in cultivation are the offspring of *Aubrietia deltoidea*, a lavender and purplish blue flowering denizen

Seeds planted in cold frames late in April or early in May germinate quickly. Seedlings transferred into the open ground when of sufficient size under ordinary



Aubrietia hybrida, "Lavender"



Arabis alpina, *grandiflora superba*

of the mountainous regions of Greece and Asia Minor. Bedecked with myriads of blossoms during April and early May *Aubrietia Frabeli* appears in deep lavender, *græca* light purple, *Hendersoni* deep purple, and of the new named large flowering hybrids, "Dr. Mules" deep violet, *Moerheimi* rose pink, *Leichtlini* "Crimson" deep red and the variety "Lavender" light lavender blue.

Arabis and *Aubrietias* thrive best in a light sandy soil enriched by old barnyard manure. The open sunny situation is generally considered best for them but within the Middle Atlantic States I notice both of them are doing also exceedingly well in partial shade. In rock gardens avoid for plantations of aubrietias fully exposed southerly and southwesterly slopes. During periods of prolonged drought they require irrigation. Omitting sufficient watering in mid-Summer proves fatal.

cultivation and care grow up to trade qualities and are ready for rockgarden planting during October. Old plants should be lifted after flowering and divided before the hot waves of mid-Summer are due. Both the *arabis* and *aubrietias* call for a light Winter protection. For northern states leaf covering is preferable.

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 724)

And then consider the method of soil preparation and compare it with ours. We gathered the impression that at Aldenham, in every case where intensive culture prevailed, the ground was trenched three feet deep, and sometimes even deeper. The orchard, the vegetable gardens, and the herbaceous borders have all been subjected to this procedure, and again it must be admitted that it produces results. But when we think of the tons and tons of soil moved by hand on the end of a spade we doubt if this method of securing results will ever appeal to the American temperament. However, we cannot help admiring the tenacity of purpose that sticks at nothing, no matter how much labor it involves, to achieve supreme excellence in the products of the garden.

TO WILD GARDENS

Wild gardens by the roadsides,
And clambering up the hills,
Carpeting the meadows,
And bordering the rills;

Wild gardens on the mountains,
And by the Summer sea
With denizens of butterflies,
And swift, industrious bee;

Rioting in color,
Sweet with perfume too,
Brightening every vista,
Framing every view;

Nature's truant children,
Roaming at your will,
With beauty you're incarnate,
With joy our summer fill.

—The Guide to Nature.

Combating the Sign Board Along the Highways

JAMES BOYD, President Pennsylvania Horticultural Society

WHEN your Secretary suggested that I should say a few words to you at this meeting in regard to sign boards, I felt that he was assigning me a subject that had been pretty well threshed out by various speakers and writers during the past twenty years. In spite of all that has been spoken and written, however, the sign boards have increased in size and number and as far as I can observe the nuisance is greater today than ever before. Everybody condemns them except the people who pay for and erect them. I am speaking particularly of the enormous sign boards that are placed along our highways and deface the landscape often spoiling what would otherwise be a beautiful scene or view. It is a strange case. Let me call attention to some of its unusual features. In the first place these big sign boards are expensive, very expensive. The owner of the land gets his rental and the sign board makers have to build and brace them securely and paint them as attractively as possible. I am told that about forty millions of dollars were spent on sign and bill boards last year. It seems incredible. Since I was invited to this meeting, I have been asking all my friends what they think of sign board advertising. I have inquired of men and women, young and old and in different walks of life. I can find nobody who ever purchased an article because he or she saw it advertised on a sign board. Of course the people who observe them most are the people who travel by train or motor and they are the ones who are loudest in their condemnation. You have, perhaps, noticed that the enormous boards on the highways often advertise automobile tires or gasoline and these advertisers greatly offend the very people whom they wish to sell.

Does anybody know the true value of sign board advertising? Most of the articles advertised on sign boards are also advertised in magazines and newspapers. I wonder how a manufacturer or dealer estimates his return from sign boards on the highways? I was a manufacturer for many years and I have spent thousands of dollars in advertising, principally in magazines and trade papers and it always seemed to me as if a dollar's worth of magazine advertising would bring more trade than ten dollars worth of sign board advertising. In the first place, the intelligent buyer generally wishes to know the reason why. You can't get him by "Use Good Grit Gasoline" or "Buy Brown's Biscuit" or "Try Thompson's Tires." You must tell him why he should buy or try these things. Explain greater durability, more mileage, better appearance, reasonable price, true economy, and all those ideas or thoughts that might appeal to a wished-for customer. You can't put those on a highway sign-board because they take up too much room. Letters have to be large. People pass quickly. You *can* put them in a newspaper, magazine or even in a street car advertisement. I wonder if a sign board advertiser ever received a letter saying, "Saw your advertisement on a highway sign board, please send a price list or catalog." I don't believe they ever did. But advertisers are constantly receiving letters saying "I saw your advertisement in the So & So Magazine, please send me your catalog, etc." Now the sign board man has one advantage over the magazine and newspaper man because you can't keep tabs on him. He makes the broad claim of "General Publicity" and apparently "gets away with it." With the newspaper and magazine it is quite easy to key your ads and check them off as every mail comes in, but with the

sign board that is practically impossible. The sign board solicitor claims everything but can prove nothing. On the other hand, we who are opposed to sign boards, cannot prove absolutely that they are not worth their cost. We can prove that they are obnoxious to the great majority of the people whose custom they seek. You cannot help reading these enormous signs but the words are quickly out of your mind as they are succeeded by other sign boards or more interesting sights. Their value is purely local. You may spend \$500.00 or \$5,000.00 on a few sign boards in New York and New England but they will not bring you many customers in St. Louis, Chicago, or San Francisco; whereas, that same amount spent with first-class magazines or newspapers will bring you trade from all over the country and occasionally from remote parts of the world. Why, I remember when my firm was advertising in ten or a dozen of the prominent magazines of this country, we had inquiries from all over the world. Through one magazine we secured excellent agents in South Africa and a very good customer in Hong Kong, China. Big boards on the Lincoln Highway cannot do that.

If hotels who use large sign boards on the road, as you approach their town, would only spend that same amount of money in paint and flowers, I believe it would bring much better returns. The other day when motor-ing between Philadelphia and Baltimore, I noticed several signs placed along the road by a small-town hotel in Maryland. They read "Tired? Tuscaloosa Hotel, Oxford." Then further along "Hungry? Tuscaloosa Hotel, Oxford." "Thirsty? Tuscaloosa Hotel, Oxford." Now that wasn't the name of the hotel nor the name of the town. But it will answer the purpose. The signs were moderate in size and they didn't mar the landscape to any great extent. We noticed them because they were rather unusual and I certainly intended to notice the hotel, but although we drove through at a very moderate speed, glancing at the shops and people, their homes, etc., we never observed the hotel and forgot all about it until we were miles beyond. Now I am sure if the proprietor had saved the cost of his sign boards and spent that money making his place attractive with fresh paint and flowers, travelers would be sure to notice his house and would be much more inclined to stop than they are from reading his unique but ugly sign boards. By the way, it was on this route, soon after passing "Sylmar" and before reaching "Rising Sun" that the road goes through an attractive country down a gradual grade and comes to an end where another road crosses at right angles, the route turning sharp to the right. At this point, has been erected a very large and obnoxious sign board. It is far from all houses and as you go down the grade it is most obtrusive and spoils what would otherwise be a pretty view. I cannot remember what it advertises but my impression is, it was either gasoline or tires. I suppose we read it, but we were so loud in our execrations that all else passed from our minds. I will, however, try to find out what it advertised and when I learn I will promise faithfully not to use that gasoline or tire if I can possibly avoid it.

I understand that your Convention at St. Louis passed a resolution to institute a national campaign to arouse public sentiment against sign-board advertising on the highways. I shall be interested to hear just what has

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Native Plants for Shady Places—II

HERBERT DURAND

IN last month's CHRONICLE, I suggested a number of attractive combinations of native flowering plants and ferns suitable for foundation or "porch" plantings and gave a list of fifty plants from which any number of other combinations may be formed. This month I will consider other shady spots, common to most home grounds, which are usually either barren of any kind of vegetation or are given over to pigweeds and dock.

The most trying problem is to be found under beeches, soft maples and other trees whose roots run near the surface and greedily appropriate all the moisture and fertility of the soil. The plants generally recommended for such situations are *Ajuga* (bugle), Moneywort, or Creeping Charlie, and Myrtle (*Vinca minor*); but I have never known either of these aliens to prove a permanent success.

In our upland forests the class of trees mentioned has numerous representatives, and the soil under them is just as dry, just as impoverished as it is under the ones about the home. I have been much interested recently in observing the kind of material Nature uses to overcome these adverse conditions, for it has been my experience that there is no better guide. Here are some of the plants most in evidence:

In dense thickets of Maples: Checkerberry or Partridge Vine (*Mitchella repens*); Yellow Violet (*Viola pubescens*); Shin Leaf (*Pyrola* var.); Club Moss (*Lycopodium clavatum*); Liver-leaf—in stony ground (*Hepatica triloba*); Christmas Fern (*Aspidium acrostichoides*); half a dozen kinds of mosses.

Under a stately spreading Beech, on a dry, sandy slope; Checkerberry, Yellow Star Grass (*Hypoxis crecta*); Violet Wood Sorrel (*Oxalis violacea*); Bird's Foot Violet (*Viola pedata*); Bluets (*Houstonia carulea*); Sky Blue Aster (*A. laevis*); the slender Golden Rod (*Solidago caesia*); the Silver Rod (*Solidago bicolor*), and the Ebony Spleenwort (*Asplenium ebencum*).

These examples show a pleasing variety of foliage, flowers and red berries. The Checkerberry, in poor soil, has small leaves, but forms a compact mat which hugs

the ground closely. Its blossoms have the most delicious fragrance imaginable, and its double berries are exceedingly attractive as long as the birds permit them to remain. It is not difficult to establish, if kept moist for a time and covered with a light mulch of leaves.

The two native creeping Irises (*Iris cristata* and *Iris versuta*), I find do very nicely when added to an under-tree planting, and both the Hay-scented Fern (*Dicksonia punctilobula*) and the Spiny Wood Fern (*Aspidium spinulosum*) give excellent accounts of themselves.

Most everybody admires mosses. Few seem to know, however, that many of them may be successfully transplanted and established in dry, shady places. I have cut sods of moss 6 inches square, and 2 to 3 inches thick, brought them home from the woods and had them cover four times their original area within two years, with the richest kind of carpet.

There are many shady corners where the soil is damp and rich, and every one of them can be made a beauty spot, by planting ferns and native wild flowers. One of the daintiest and loveliest plantings I have ever seen was in a shaded fence corner. It was composed of a Maiden-hair Fern, Shooting Star (*Dodecatheon*), Blue Bells (*Mertensia*) and White Trilliums, with an edging of the ever-blooming Canada Violet.

The two Baneberries, *Actaea alba*, with white fruit, and *A. rubra*, with red, are exceedingly handsome plants for massing. The Wild Red Lily (*L. Philadelphicum*), the Cardinal Flower (*Lobelia cardinalis*) and the Virginia Speedwell (*Veronica virginica*) may be interspersed among them with striking effect.

Where the soil is continuously moist and largely of leaf mould, Spring Beauties, Toothwort, Trout Lillies, Anemones, some of the Lady Slippers, the Foam Flower (*Tiarella*), Jacob's Ladder (*Polemonium*), nearly all the violets, and nearly all the ferns may be introduced and combined in infinite variety.

And in exquisite loveliness, such a planting should not be excelled by any collection of rare plants that could possibly be assembled, even though the four quarters of the globe were searched for their choicest floral treasures.

October Birds

PAUL B. RIIS

THE hot, sullen dog-days have been closely followed by intermittent equinoctial storms. All Nature has been at war. The oppressive heat discouraged the normal growth and development of crops and hastened their maturity. Rains and downpours are frequent with occasional days of sunshine breaking the monotony.

These days abundantly blessed with the mellow warmth of October sunshine are typical Autumn days, with the richness and glory so intimate with the season of maturity. What days of any season may compare with these wonderful days of Autumn? The early days of Spring-time, buoyant with the reawakening of life, or the golden days of June, flooded with light and sunshine or the grand days of Winter glistening with myriads of crystals with the sun sinking lower and lower in the horizon? Indian Summer alone may be a fair competitor.

A ramble afield through meadows and woodlands reveal many surprises each one interesting in itself, each a treasured revelation. We may follow the meandering course of the brook or keep closely to the shore of the river and soon we note that the birds are also taking advantage of the generosity of the season. Leisurely we approach a clump of sneezeweed when we are attracted by the lisping notes of migrating warblers in the willows overhead noting these to be Tennessee Warblers. A more familiar call note ahead brings us close to a flock of white-throated sparrows. There are many immature birds as evidenced by a less conspicuous marking of the plumage and the fragmentary recitations of that beautiful strain so familiar in the meadows of our Northern States. The dry rattle of a kingfisher betrays that worthy engaged in piscatorial pursuits. The sweet: weet, weet, weet, re-

veals a lingering spotted sandpiper flying low over the water. Green-winged teal are frolicking to the right of the island their privacy broken by the intrusion of an inquisitive grebe. The musical waters reflect the incomparable October sunshine in ripples of gold and azure of the October sky. Snatches of song from the meadowlark and the sweet call notes of the bluebird above break the stillness of the hour.

A song sparrow, reminiscing in the wonderful balm of the day belies the lateness of the season, as does a solitary robin in the topmost branches of a giant sycamore. An early flock of brant, headed southward sharply contradicts the efforts of the song sparrow. We also hear the saucy scolding of a belated house wren. Here we find a brown creeper, not seen in many months. Briskly it climbs a trunk in its characteristic fashion exacting its toll of larvae as it ascends. A flock of juncos take alarm and we note with pleasure the alert and business-like methods of the red-breasted nuthatch, reversing its order of taking toll from that of the brown creeper by working its way from the top downward. The chickadee too lifts its cheery voice from a distance. Red-headed woodpeckers made reckless to the flight of the season with abundant crops of acorn are bitterly quarreling with their competitors, the blue jays. And such exceedingly useful allies, the downy and hairy woodpeckers gladden our sight. A pair of mourning doves, which fortunately escaped the eye of the hunter, draw us to the open. A nasal call note, in imitation of the goldfinch comes from a flock of pinskins busily eating the seeds of the dandelion and we further note a flock of long-spurs quietly stalking the stubble field.

The appended list discloses such birds as may be found arriving and departing in Northern Illinois during this month.

DEPARTURES		Oct.
Oct.		15
1 Maryland Yellow-throat		16
Grinnell Water Thrush		17
2 Golden Plover		Caroline Wren
3 Clay-colored Sparrow		Short-billed Marsh Wren
5 Red-eyed Vireo		Wood Pewee
Night Hawk	18	Catbird
6 Pectoral Sandpiper		Redstart
Greater Yellow-legs		Blue-headed Vireo
7 Solitary Sandpiper	20	Magnolia Warbler
Yellow-headed Blackbird	22	Black and Green Warbler
Lincoln Sparrow	23	Water Thrush
Bay-breasted Warbler		Henslow Sparrow
8 Rose-breasted Grosbeak	24	Scaup Duck
Baltimore Oriole		Hermit Thrush
Grasshopper Sparrow	25	Yellow-bellied Sapsucker
Woodcock	27	Tree Swallow
10 Baldpate		Oven Bird
11 Chimney Swift	28	Meadowlark
Osprey	30	Broad-winged Hawk
Black and White Warbler		
12 Green Heron		ARRIVALS
13 Scarlet Tanager	4	American Crossbill
Ring-billed Gull	15	Smith's Longspur
House Wren	17	Northern Shrike
14 Bittern	20	Brant
Bobolink	24	Pipit
Palm Warbler	31	Lapland Longspur.

COMBATING THE SIGN BOARD ALONG THE HIGHWAYS

(Continued from page 728)

been accomplished during the past year. Taxing sign boards as proposed by the Governor of Pennsylvania seems to me an excellent move in the right direction, grading the tax according to measurement and making it particularly heavy for the large boards, with the provision, of course, that a man may advertise a business that is conducted on the property where he wishes to erect a sign, without paying any tax. Even under those cir-

cumstances he should be limited to a sign not larger than 6 x 4 or 24 square feet.

The American Civic Association has issued a very interesting booklet on this Billboard Nuisance and I would like to quote a few paragraphs from it:

"It is plain common sense that if you are going to build a house, you won't want to buy a lot that has a billboard facing it. That billboard may stay there for years. When one owner of a vacant corner lets a billboard be erected on it, he prevents a ready sale of the other three corners, whether they are built upon or not.

"So long as the billboard stands, so long will it deter buyers; it will postpone sales, which means monetary loss from holding the property a long time, paying taxes and losing interest.

"But it is not only his neighbors' land that the lessor to the billboard company depreciates. It is his own. If land in the neighborhood won't sell, neither will his.

"When billboards reduce the value of property, there is a corresponding reduction in the assessments of those properties for taxation purposes. There is also a corresponding reduction in the borrowing capacity of the city or town, because that capacity is based on a fixed percentage of the total real estate assessment."

It has been suggested that there is such a thing as reaction from advertising, that there is advertising that induces us *not to buy*. Let us also throw all our patronage to the people who do not offend the public in this way. I have owned and driven motor cars for twenty years and have used many makes of tires and all brands of gasoline. I forget the make of tires I had on my first car in 1901 but I remember in 1904 Diamond Tires seemed to be the best. In 1907 I used the French Michelin Tires but in the last ten years such improvements have been made that now I could name eight or ten first-class makes any one of which, if I was assured the makers were opposed to sign board advertising, I would be glad to use. Why don't enterprising firms whose competitors are spending much money on big sign boards, advertise in newspapers and magazines that they are opposed to sign board advertising and *do not use it*? I believe their sales would increase tremendously if their product was first class.

In conclusion, I wish to say that I thoroughly agree with Mr. Clinton Rogers Woodruff, Vice-President of the American Civic Association and Secretary of the National Municipal League, who writes in *The Craftsman* as follows:

"I must confess to a liking for the boycott remedy. It has a very practical advantage—there are no provoking or perplexing delays, no court proceedings, no injunctions, no appeals. It is neat, clean, unmistakable to the one who knows best, and effective. Not that I underestimate the value of the prohibitive ordinance and act of assembly, or the great influence of the taxing power—because I believe in using every legitimate weapon in attacking an enemy—but the boycott is always at hand, and can be applied without delay and without any thought as to its legality. All that is necessary is to make up your mind that this one thing I will not do—I will not deal with any one or use any article that resorts to objectionable advertising."

A CHRISTMAS GIFT

We all appreciate practical gifts, so why not give your friend a subscription to the GARDENERS' CHRONICLE for Christmas? \$2.00 a year.

The Chronicle Press, Inc., 236 Fifth Ave., New York, N.Y.

On Daffodils: Tips for the Inexperienced

YOU get hold of a daffodil bulb, but there is nothing in itself to tell anyone who handles it for the first time that the earlier it is planted in the ground, the better it will be for it in the future. It will bear a larger flower and in every way be stronger and healthier. Plant as early as possible in beds or borders, but *never* after the middle of November. Point No. 1.

When daffodils are put into pots, the first essential is to do all in our power to see that they form good roots. Just as a kitten has to have its eyes opened before it can see, so a bulb has to have roots before it can put forth healthy growth. It is by their means that it can take its proper food and absorb the liquid without which it cannot live. Now it is in the order of Nature that darkness helps root growth; hence, to start with, the pots of bulbs should be buried for about six weeks in sand, fibre or clean sweet ashes. Point No. 2.

A bulb is a storehouse for Winter. Zoology tells us how certain animals store in underground holes sufficient nourishment to keep them alive during the Winter, so we learn from botany that a daffodil is able by means of its foliage to manufacture food, and that it can then, by a certain wonderful arrangement in its interior, send it down, as it were, by a lift into its underground storehouse—its bulb. I am open to correction, but I believe a very great proportion of this food is made after the plant has done flowering; hence it must be the object of the gardener to see that the green leaves are retained as long as possible. Leaves, then, should never be cut off while they are green. Point No. 3.

In this article I have in mind those who wish to plant in ordinary beds or borders; hence two questions need be answered: (1) How deep must the bulbs be buried, and (2) should the ground have any special manure or be in any way prepared. A good general rule with respect to depth is to have at least 3 inches of soil over the top of the dry bulb when planted, and if there are 4 inches or 5 inches (in all but the very heaviest soils) so much the better. Of course, tiny mites like *minimus* and *cyclamineus* would do very well with only 2 inches. This is Point No. 4.

The question of manure is most important. Like all sensible men, daffodils are moderate in their eating and drinking. They do not like too rich food, nor too much of it. In preparing beds in which to grow a collection the ideal thing is to give the ground a jolly good dressing of old farmyard manure the Autumn or Spring before the daffodils are to be planted, have a crop of potatoes in it, and then when preparing the following year for the bulbs mix some bonemeal with the soil. In the case of clumps in borders, or of beds on a lawn, where the soil is in good heart, all that need be done is to mix bonemeal with it at planting time. This is Point No. 5.

Some people are bothered to know if they should take up the bulbs every year, or if they should be left in the ground, and if they are left in, how long should they be left. As a general rule bulbs may remain undisturbed for three or even four years, after which they are all the better for a change. The question of taking up or leaving in depends, however, to some extent on the variety; but this belongs rather to the niceties of management and the beginner had better confine his choice to varieties with which one cannot well go wrong. Bulbs should be lifted after they have flowered three times in one spot. Point No. 6.

Point No. 7 is of equal importance to any of the others. It is the choice of suitable varieties. In making the selection for outdoors which follows, I have been guided by three considerations: First, each one is a reliable "doer"; secondly, they are all of fairly moderate price; thirdly, the twelve make a varied assortment and include examples of the more important sections. *Emperor*, one of the oldest of the big trumpets, with both trumpet and perianth of a palish yellow. *Weardale Perfection*, a large pale bicolor trumpet. *Empress*, another and much older variety; not so large as the last and with the trumpet of a much deeper yellow. *Mme. de Graaff*, classed as a white trumpet, but it never goes absolutely white; nevertheless, there is no low-priced one any better. *Lucifer*, one of the small number of red cups which do not burn; white perianth with a long orange-red cup; this, however, is only recommended for light soil. *Frank Miles*, a most decorative shape and of a pretty tone of yellow, practically a self; it makes an ideal flower for cutting. *Barrii conspicuus*, one of the old varieties but still one of the very best; the red edge of the yellow cup is very charming. *Seagull*, white perianth with a canary cup sometimes showing an edge of pale orange-red. *White Lady*, a remarkably good *Leedsii*, large white perianth and crinkled lemon cup; no one should omit this variety. *Mrs. W. O. Wolsley*, an almost white *Giant Leedsii*, large cup and very white broad perianth; only recommended for light soils. If the soil is on the heavy side *Norah Pearson* might be substituted; but the flower is more of a bicolor, as the long cup is yellow. *J. T. Bennett-Poë* is almost a primrose self and has the characteristic look which triandrus parentage always gives its progeny; this is seen in the shape of the cup or trumpet. *Aspasia*, one of the new hybrids which are taking the place of the old bunch-flowered varieties of which *Solcel d'Or* and *Grand Monarque* are typical examples. It is quite hardy and has from three to five large blooms on each stem; perianth white, cup yellow. *Cassandra*, one of the new Poet Daffodils which mark a very great advance over the early-flowering ones of this section, such as *ornatus* and *angustifolius*; large, spreading pure white perianth, and somewhat small *poeticus* eye. *Horace*, a giant Poet Daffodil with a great deal of red in the eye; *Argent*.—Doubles are not a popular section, but this is so lightly built and of such a pleasing light color that it is becoming a very popular flower. *Campanelle Jonquil* (*rugulosus* variety).—Few seem to know this dainty deep yellow, bunch-flowered variety. It has three or four smallish flowers on each stem and very characteristic rush-like foliage. *King Alfred*.—In soils and climates where the air is mild and humid, this variety should never be omitted. It is a glorious big, deep yellow self, shapely in form and tall in stem. Alas, it is no use trying to grow it in the greater part of Great Britain, but it is a real beauty when it does well. A list on the above lines is my Point No. 7. It is not a selection of the cheapest, but one which tries to combine reasonable prices with good reliable doers and pleasing and distinct varieties.

It will be noticed that there is very little red coloring in the collection. The reason is that red so soon burns that it had better not be overdone in choosing suitable subjects for outdoor planting. I cannot after all to leave out *Lady Margaret Boscaten*. It is a large and effective *bicolor incomparabilis* of the *Sir Watkin* type, and in every way a great flower.—Rev. JOSEPH JACOB, in *The Garden*.

The Greenhouse, Month to Month

W. R. FOWKES

CHRYSANTHEMUMS have exceptional merits at a season when Nature has clothed herself in grey, for they produce an almost endless variety of color, and to this, may be added the wonderful readiness to adapt themselves to the most smoky surroundings. The extent of one's ambition as a chrysanthemum grower must vary with the opportunities and the time at one's disposal, but as soot and smoke are not against the efforts of most of us, we may well take heart. Those who are really in earnest will be certain to succeed and in a season or so will develop into experts.

Some years ago the 'mum season was of short duration; many people did not deem it worthy to spend a year for a brief display, but thanks to the hybridizers, we have now a range of varieties, extending from early September until the end of January. A protracted sojourn has been established and all lovers of the beautiful Queen of Autumn are fairly bewildered at the great change. If they have had the cultural details prescribed previously, little remains to perfect the good work. Red spider is a dangerous enemy, and to avoid it, the foliage should be cleaned and a sweet, cool atmosphere maintained. Remember that 'mums are cool loving subjects and will not submit to coddling.

One should be careful to keep water off the opening blooms. Water with a can in the forenoon, mopping up any dampness. Stop feeding, for the food contained will be sufficient. Should any petals decay, take them off carefully. A slight shade is also helpful.

Caladiums that have arrayed the conservatory must be gradually rested, and wintered in no less a temperature than 60 degrees. Gloxinias should be treated likewise, only a lower temperature will be necessary.

Calla lilies will come in to follow Summer plants. Chorizemas are a most interesting genus of plants, natives of Australia, which bloom exceedingly well in Winter and are of easy culture, not difficult to manage, useful for cut flowers and decorations. Those recently potted will now require a nice warm corner of the greenhouse, careful watering, and when thoroughly established, a watering of soot-water twice daily.

Primula obconica is very decorative, but does not succeed in hot weather. They can at this time be given their final potting, even if partly blooming.

Cyclamen are usually better if potted not later than the middle of September, but fine specimens can be had by placing them in eight inch pots by the first of November. Use cinders for drainage and fumigate once weekly to keep aphids away. Do not allow overhead watering and give full light and cautious ventilation. Draughts must now be avoided. We have reached the Autumn period when maturity demands care, and carelessness in ventilation will surely bring its disastrous train of disease.

Orchids now take on a firmer and more solid growth. *Cattleya labiata*, with its double sheaf, is blooming and along with it, *Cattleya Bowringiana* with its large bunch of purple protruding from a slender bulb. Supply these fleshy blooms with sufficient water, and reduce the temperature, but not with a lot of air. The orchids in bloom demand shade. Orchids are getting to the position they occupied many years ago, being owned only by a few.

We can no longer buy the imported products from the Indies and other remote lands, so we must do our own propagating by division. Take a strong plant only for this purpose, and partly divide with an incision through the rhizome, and in a month's time, keeping it fairly dry, the work can be completed.

Oranges and lemons are favorite plants for many people, and those desirous of obtaining specimens should sow the pips now, in pots containing light rich loam and bottom heat. When 18 inches high, bud or graft, with prolific kinds.

The home greenhouse is not intended for a botanical museum. It is our place to make it profitable, and then it will surely please the eye. I shall never forget Hamilton Scott's place at Yonkers. For limited glass room he displayed good judgment. In a small range of glass he raised in the Winter months two crops of tomatoes, Winter Beauty being succeeded by Comet; cucumbers in 10-inch pots were grown at the end of the house; string beans in 10-inch pots between spaces on benches; chicory in pots under the benches; asparagus and rhubarb, and while the latter plants were young, lettuce and radishes were grown. Smilax was grown for table decorations up the supporting columns of the greenhouse. It is time to sow this plant, and give plenty of water to swell the hard seeds.

Cauliflower should now be sown to occupy a cool bench when it appears. Vaughan's new Snowball is excellent. Sown in a pot or box, with little trouble, they will germinate and can be transplanted into small pots, and remain until ready for planting. Be careful to soak the soil with a light dose of Vermine before planting, so club will not appear afterwards. Gladioli are useful favorites indoors, requiring a long season of growth. The Bride is a fine early white and needs cool treatment, similar to freesia culture. Do not try to force or one will get nothing but leaves.

Freesias must occupy as light and cool a position as possible. They need supports, and a few twigs are suitable.

Strawberry plants should be now given their final shift into 6-inch pots. It was once thought useless to pot after July, but heavy crops have been grown in 5-inch pots, which were potted early in November. The most important feature is the proper soil. It should be heavy and contain no humus, but bone meal, and the perfect kind is Vaughan's rose grower. The plants should be potted firmly and placed in a frame plunged in ashes, where they can remain until January.

The pot fruit trees must be kept outdoors and allowed to freeze. The first November frosts will help to season them, and they must not be excited.

If rose benches are uneven and the soil washed away from the roots in places, fill in with soil from the compost heap. Do not top dress with cow dung. It is an expensive item that is unnecessary, and produces black spot invariably.

Take thy self-denials gayly and cheerfully, and let the sunshine of thy gladness fall on dark things and bright alike, like the sunshine of the Almighty.—J. F. CLARKE.

Work for the Month in the Garden

SAMUEL GOLDING

NOW that the month of October is here, we realize that for the majority of subjects the real growing season is over. Until this date, we have been immune from killing frosts; this happy condition may end at any time now. Therefore, we must push on with the harvesting of crops.

Lift late potatoes, carrots, beets, and store away; finish earthing up late celery, and choose fine weather for this operation as it is necessary to avoid doing this when the plants are wet, or the soil is in a sticky condition. Tie up the plants before earthing, and press the soil firmly around each plant to prevent it from getting into the hearts.

Protect cauliflowers by tying or breaking the leaves over the center, but if severe frost threatens, lift them and heel in close together in a deep pit or frame. If one fails to have these, a light shed will give the necessary protection. Be prepared to protect lettuce and endive by having some salt hay on hand to cover over them. These can also be lifted and placed close together in frame or some temporary shelter.

Clear away all dead and decaying foliage from Brussels sprouts, or other brassicas so they can derive all possible benefit from air and sunshine, during the brief season that remains to them. Keep late spinach free from weeds, and encourage its growth in every possible way.

Lift some chicory roots and store in a cool place, if a constant supply is needed for salads. A few roots may be introduced into a fairly warm cellar, or house where the light is excluded. The mushroom house is the ideal place for forcing this salad to get the perfect blanched leaves that are necessary. A few roots of rhubarb can be lifted and exposed to frosts before being taken inside for forcing. Continue to collect materials for any successional mushroom beds that may be wanted.

Cut over the asparagus bed as soon as the stems are ripe and give a good dressing of manure. If this is forked in during the late Fall when the conditions are right, it saves valuable time when the Spring rush is here.

Manure and dig any vacant ground. Time given to deep digging or trenching is well spent. It makes for greater fertility by reason that it helps to create a deeper rooting medium which assists all crops to withstand drought, in a marked degree, much better than crops sown or planted in land just forked or ploughed over. If done now it will receive the beneficent influence of the Winter's frost upon any subsoil that may be brought to the surface. But one must bear in mind the advice offered in the Spring, that there is always a right time and proper condition when to work the soil. If the condition is wet and easily trodden into a putty-like mass it should be avoided or more harm than good will result.

As soon as the frost has cut down the plants in the formal flower garden, clear them away at once, taking inside anything that may be wanted for stock. Store away the tubers of begonias in dry sand.

Fork over the beds and make ready for planting

the Spring flowering bulbs. It is well to defer adding animal manure to the beds until preparing for planting the Summer bedding. Should the soil be of a heavy retentive nature, it will benefit from a good dressing of leaf soil. Early tulips, hyacinths, and narcissi can be planted. Get in crocus, scillas, grape hyacinths, etc., and plant all hardy lilies as soon as they are received from the dealer. If left out of the ground for any length of time, they become shriveled and their vitality is much impaired.

If any alterations are contemplated in the herbaceous border, it should be done at once. The lifting and dividing of those plants that have become too crowded, if done early, will make new roots and become established before Winter sets in. Plant out young stuff raised from seed which has been grown on during the Summer.

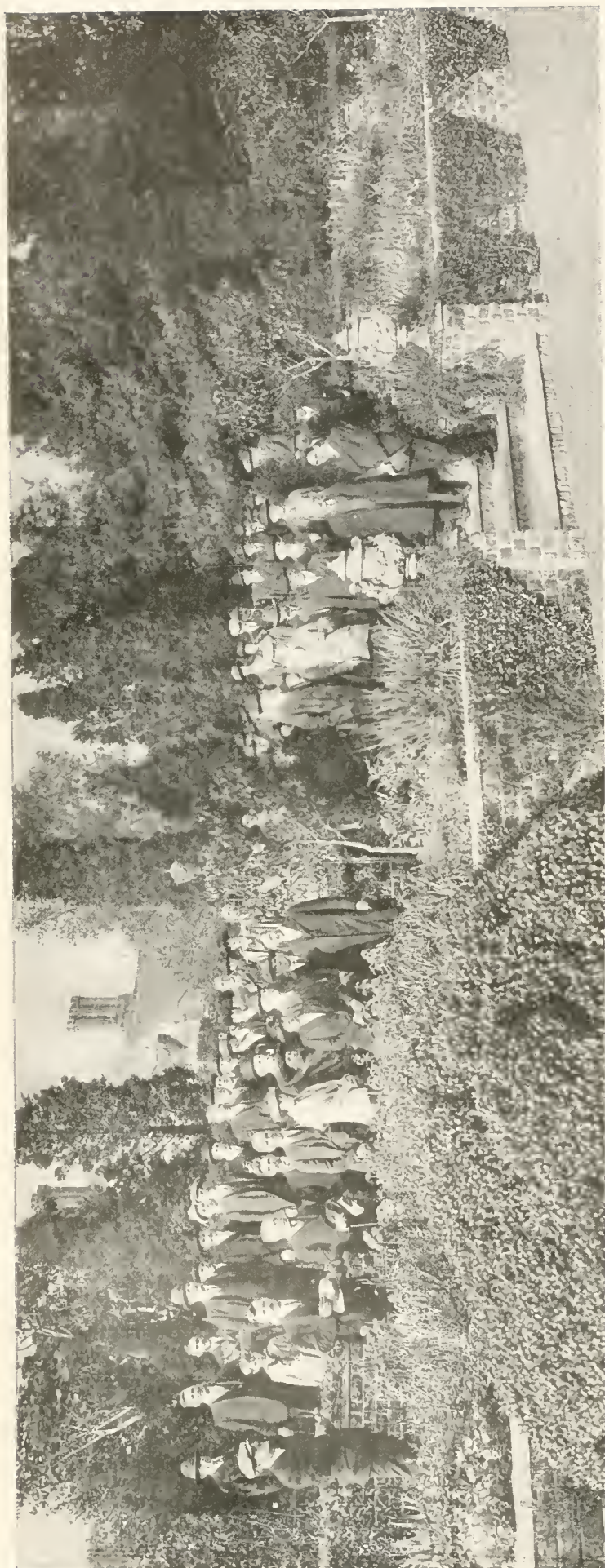
The borders will continue to be attractive with such plants as Eupatoriums, late asters, late planted mignon dahlias, gladioli, celosias, and the hardy chrysanthemums which are the mainstay of this season. Many fine varieties have been added to this invaluable class during the last few years, and the amateur who has added these novelties to his garden can be assured of good material for cutting throughout this month, providing some simple precaution is taken to give some protection if severe frosts threaten.

As soon as the frost cuts down dahlias and cannas, lift them. See that all dahlias are properly labeled. Allow them to dry outside for a time and then store away in barrels or boxes, stem downwards so that any moisture can drain away, otherwise it may be a menace to the crowns. A cool frost-proof cellar is a good place to keep the tubers.

Keep the lawns cut and trim until growth ceases. From now on the raking and carting of leaves will be the order of the day. It is a great mistake to burn the leaves providing one has any room or place to accommodate them. They should be carefully garnered where they can later be used, possibly for protecting the rose beds, or for covering the celery for the Winter outside, where one has no root cellar to store away the crop, or protected outside from choice. In the Spring these leaves are again gathered and placed in some position where they decompose and form leaf soil, which is a most valuable asset in the garden, as it can be used to advantage in vegetable and flower gardens, and it is invaluable for compost, in potting or transplanting seedlings.

Many growers prefer to get their stock of roses now instead of waiting until the Spring, when there is a heavy demand for these plants from the nurserymen. If they are not planted into their permanent beds this Fall, they can be laid in and wintered in a cold frame, and are on hand in the Spring ready to be planted when the conditions are right.

Shorten back long growths on Hybrid Teas and Hybrid Perpetuals. This prevents much damage arising from winds which loosens them at the collar and other evils, if allowed to retain the long straggling growths.



Convention party at Planting Fields, Oyster Bay, L. I., the estate of W. R. Coc. Mr. Coc is standing at the top of the steps in light suit and cap.



Welcoming the Visiting Gardeners to New York

MRS. SAMUEL SLOAN, President, Garden Club of America

I HARDLY know why I am here! You are probably as much surprised as I am! I am in great awe of you; for I feel like a woman who was president of an art club and in writing to the Federation of Arts for information, said she knew nothing about art, and was president only because she was willing to work.

It is a great honor your secretary, Mr. Ebel, has conferred upon the Garden Club of America in asking its president to welcome you all to New York for your annual convention. We, who live near New York, are happy to have you meet here and we extend to you a sincere and hearty welcome.

Of course, each one of you feels that his particular spot, whether in New England or the West, is the best! However, we think that right here in the vicinity of New York we have many gardens of which to be proud. It is a pleasure to know that you are to visit several of the beautiful estates nearby and I am sure you will enjoy seeing them.

No matter where I go gardens (and the love of gardening) are taking hold of everyone. Everyone is talking, thinking, and dreaming of gardening. We have all heard of hanging gardens, air plants, formal and informal gardens, and in fact all kinds of gardens, but I confess I wondered when I saw "apartment gardens" advertised. Are they on the roof, each owner having a piece? We all notice a tremendous and a fortunate change coming over America, and I hope that gradually we shall see everyone more interested in the subject, and that all will feel the necessity and desire for a garden.

The Garden Club of America wishes to encourage Beauty in Gardening as a fine art. You can help better than anyone by encouraging young men to enter the profession (I will not speak of young women, for very few of you like them as gardeners). There is no nobler or better calling than gardening, and we need the best gardeners.

There seems to me to be many classes of amateur gardeners:

1. The estate owner who takes neither a vital interest

nor particular pleasure in improvements, and leaves all decisions and responsibility to a competent superintendent. You and I do not like this relation where there is no sympathy between employer and employee.

2. The owner of a small garden who has real knowledge and taste and works in his or her own garden.

3. The owner of an estate of medium or large size who is keenly interested in all improvements for beautifying the garden and who wants and expects the best.

Eighteen months ago your president, Mr. Craig, gave a very delightful address before the Garden Club of America on "The Relation of the Employer to the Employee." It was a most interesting talk and one which sank deeply into the minds of his audience. The need of sympathy between employer and employee is great. No one can do good work without encouragement, but do you ever realize that the employer also wants encouragement? In these days of garden craze, of garden books, and garden lectures, are you surprised if an owner, who has observed and studied, thinks she knows something and wishes to turn her garden upside down and inside out? You may know her idea is unwise;—perhaps this tree will die, and these flowers will not grow—but do not discourage this enthusiasm and this desire for knowledge. Let her learn by experience; we all must. Please be patient with your enthusiastic employer, for without your co-operation it is impossible to change the badly planted stiff flower beds into restful and charming surroundings in which to live.

I have just heard that 22,000 cannas were planted in Washington this Summer. Think of the horror and waste of time!

I do want to make a plea to you for better and simpler effects in landscape gardening. Do not sacrifice everything in trying to grow bigger flowers than your neighbor, or in attempting to have larger gardens, but remember the best and happiest background is simplicity, for there rest and beauty are found.

Help make Gardening a Fine Art.

Samuel Untermyer's Esteem of the Profession of Gardening

THE National Association of Gardeners, who have held their annual convention in New York City, visited Greystone, the magnificent estate of Samuel Untermyer. Following the meeting, the members motored to Greystone, and enjoyed luncheon. Mr. Untermyer came up from New York in the course of the luncheon especially to address them.

Upon his arrival he was greeted with a great burst of applause. He said in part: "I have come here from the city for the purpose of greeting you and welcoming you to Greystone," he began. "I congratulate you upon your profession, for it is a profession. Indeed I envy you. It is one of the greatest and most scientific of all professions.

"I have often told my friend, and gardener, Mr. Milard, that I would like to exchange places with him. I would like to live among the plants and flowers, while he grubbed in Wall street." (Laughter.) "You have in your keeping the progression of a great work, and the

opportunity to do great good. To you has fallen the work of developing intensive vegetation. You can do what no other man can do; you can make two blades grow where but one grew before."

It had long been his ambition, he went on, to get away from the artificialities and turmoil of business, to get back to the quiet and beauty of nature.

Mr. Untermyer spoke of the great opportunities that are open to the women of the country in gardening. She is the creator, he said, she has the natural sympathy with Nature. "If you start her at gardening," he declared, "it won't be long before you men are out of the race."

The work of the gardeners of the country is most important, he continued, explaining how they are teaching the world what to eat and giving the world better things to eat. He spoke of the great undertaking of Col. William B. Thompson, who is about to spend a fortune on a vast horticultural research laboratory on his estate, north of Greystone.

"The plans are completed," he said. "It is the ambition of his life to do something for the future of America. He has engaged some of the best men in the country. He is sending men abroad to gather a great biological library. He is going to rob the libraries of all the bankrupt nations—and I wish him joy.

"You will all be able to use that research laboratory, a feature of which will be the analysis and investigation of the soil. This feature is a very good one because I don't think you gardeners know anything about soil

(laughter) except Mr. Millard (laughter) and he doesn't know as much as I do (much more laughter) and that isn't much.

"Again I welcome you and offer you all the hospitality of Greystone."

After the luncheon the men made an extensive tour of the greenhouse and grounds, led by Albert Millard, the superintendent, and W. H. Miller, the assistant superintendent. Later in the afternoon the party continued its journey to the Rockefeller estate at Pocantico Hills.

President W. N. Craig's Convention Address

FELLOW members, Ladies and Gentlemen:—

It seems eminently fitting that the National Association of Gardeners should celebrate its tenth anniversary in the city of New York in which we have not met since 1913. At Madison, N. J., in 1911 our organization as a real working body made its initial bow. We may not have accomplished all that could have been wished in the first decade of our existence but no one can deny that we have made substantial progress, not in members only, but in principles and in a sincere effort to place the profession of gardening on a higher plane. We may be criticized for some omissions but the work of the critic is ever an easy one, and those who have labored the most diligently can justly claim that their work has not been entirely in vain, though many do not appreciate their efforts.

We are very glad to come to this great city, the centre of the greatest horticultural activity in the New World, for here, quite naturally, much of the strength of our association lays, which would seem to amply justify the selection of the gateway of the Western World as our headquarters as well as our meeting place today. We feel sure that as a result of our gatherings, each one of us will gain new ideas and inspirations from our deliberations and the instructive inspection trips planned for our benefit by the local convention committee. I would that a greater number of members could attend these annual conventions for they broaden our minds, make a pleasant change from our regular tasks, and send us away better fitted for what lies before us. But shortage of labor, and the transportation charges prevent many from attending who would like to be here.

Our country with the world at large still suffers acutely from business depression, the aftermath of the great world war, which will remain in some measure throughout all our lives, and our profession has felt the existing economical conditions in fully as great a ratio as most of the other professions and industries. Seeing, however, that floriculture and in some measure, horticulture, are in a certain degree luxuries, it is comforting to reflect that both here and abroad adversity has failed to dampen the ardor of those who are interested in gardening. In America, we have had this year a wonderful Spring show and a record Dahlia show in New York. Boston had the finest Spring exhibition in its history, a show of native orchids in April which attracted 25,000 visitors and which was staged by the wide-awake and enthusiastic president of the Massachusetts Horticultural Society, Mr. A. C. Burrage, and a most unique and artistic show of tropical ferns and orchids in September. A mammoth show is planned for Los Angeles this Winter, and from all parts of our country there come reports of splendid exhibitions of roses, dahlias, gladioli, peonies, and other popular flowers. Looking ahead we find that we shall have another Grand Central Palace show in New York next Spring; a fine bulb show in Boston, also one of native

ferns, and the greatest Spring exhibition ever staged in America, in Cleveland, as some of the stellar attractions. Surely this would indicate that the leaders of horticulture are not pessimistic as to the future here, while abroad in Great Britain, France, and Belgium, which suffered vastly more from war's ravages than we, flower shows have been wonderfully successful, and there is no slackening in the enthusiasm for gardening.

Perhaps the most encouraging sign of the present time is the rapid increase in the number of garden clubs and kindred bodies which have maintained and stimulated a love of horticulture among those best able to support it. Even in rather remote sections of northern New England these garden clubs are being organized and the keen interest, intelligence, and activity of the members of these clubs, not composed of ladies only, as is commonly supposed, augurs well for the future of gardening. Our association is endeavoring to assist and co-operate with these organizations in every possible way.

Owing to existing economical conditions, the calls on our Service Bureau by men out of employment have been quite numerous, but because of the reduction on some estates and the development of but few new ones, it has not been possible to place as many applicants as we could wish. In this respect we are not greatly dissimilar from other professions, all of which are feeling the present period of readjustment. It has been found that the necessary advance in the cost of our annual dues, made at the St. Louis convention, has not greatly affected our numerical strength, while the additional dues help quite materially in popularizing and strengthening this valuable feature of our association. We have had a good addition of prominent estate owners as sustaining members, and we hope for a further strengthening of this class of members in the immediate future. The fact that we are endeavoring in every legitimate way to furnish competent, reliable men to estate owners and to promote at the same time that spirit of friendly co-operation which in my humble opinion must exist between employer and gardener for the really successful operation of a garden or estate, has brought us many words of commendation and good cheer.

I cannot refrain from again touching on Quarantine No. 37. There have been additional orders from the powers that be in Washington, but Quarantine No. 37 has dealt the heaviest blow to horticulture of any. As an organization we have endeavored in every possible way to secure some modification but so far without avail. We were told that the quarantine when placed on the statute books would, like the laws of the Medes and Persians, remain forever, but I still have faith that a measure so manifestly unfair which has had so stultifying an influence on horticulture in its broadest sense will ere long be modified. Our commercial friends, the nurserymen particularly, who at one time vehemently opposed this

quarantine seem to have concluded that hopes of revision are slender and with fear of being disciplined, if they continue their opposition, seem resigned to their fate.

Not a few are now propagating roses, azaleas, rhododendrons, and various other debarred plants in large quantities, which proves the quarantine to have some redeeming features, but for it, we would have continued to import many plants easily propagated here. However, it is unfortunate that the Chinese wall built up against plants from abroad, while it has stimulated some home production, has at the same time very materially advanced the cost of all these plants to the garden lover. It is surely a narrow and regrettable policy which compels us to purchase such plants as can easily be propagated at home and denies to us interesting plants and bulbs raised by painstaking hybridists abroad. We are aware that permits can be secured after much red tape for plant novelties but when such a world noted institution as the Arnold Arboretum has regretfully decided that it is useless to attempt the importation of any more plants under existing conditions, there is little encouragement for amateurs to attempt to do so.

I feel that our association should continue to place itself on record as opposed to Quarantine No. 37. We as gardeners are perhaps more deeply concerned with insect pests and diseases than any other class of men, but we feel that the virtual embargo on all plants and many charming and harmless bulbs from our gardens must not be allowed to stand, even though we be offered bulbs of the debarred bulbs and plants produced at home at several times their cost abroad. And when we consider that such dangerous and destructive insect foes as the gypsy moth, European corn borer, boll weevil, and other I might name, did not come in on plants or bulbs, that there is no possibility of quarantining winds, birds, aeroplanes, railroad trains, automobiles, or even the sea itself, all of which have been and are distributors of both insect pests and diseases, we believe that a rigid but sure inspection at points of shipment as well as at ports of entry, should surely safeguard the horticultural, agricultural and arboricultural interests of America.

I believe some members of our association think we might well drop the signboard nuisance campaign but I entirely disagree with them. Surely such an organization as ours should stand most emphatically for the elimination as far as possible of the ghastly advertising boards which mar so much of the picturesque country scenery. Our action has received the endorsement of the Park Superintendents of America, garden clubs, various civic bodies, and individuals, while we have had some commendatory newspaper publicity. When civic consciousness will be aroused from its present torpidity we may accomplish more. We should stand firmly for America the beautiful and refuse patronage to firms which persistently employ these advertising methods, no matter whether we are urged to buy tires, soap, pills, or near beer, not even when the boards display the catchy slogan, "Say It With Flowers."

The question of whether we can by examination or classification, select men most suitable to fill responsible gardening positions is one which will come before us. Opinions on this subject will show a sharp cleavage. We cannot afford to induce anything which may inflict hardship on deserving and competent men, whose opportunities for education were perhaps less than our own, yet it is desirable to exclude from our association and profession men who have no genuine claim to the word gardener and bring discredit on the profession. I believe that estate owners will be just as eager as we are to debar undesirables and with their co-operation it can be accomplished.

The training of young gardeners should continue to receive our earnest consideration, for although existing labor conditions may give us an adequate supply of men, a return to more normal conditions will soon reveal an acute shortage. The increment from abroad continues to be small and it is apparent that a large proportion of the gardeners and estate managers of the future must be trained here. Our state colleges and schools are in some cases doing splendid work along these lines and some public spirited estate owners are also helping. I hope more will be willing to assist in training boys and youths who show a liking or aptitude for horticultural work.

The school garden movement will be presented to us at this convention by one well qualified to speak. Personally I have for twenty years advocated its adoption and extension and it is pleasing to note that the passing of the war has not decreased its usefulness. Year by year our children show greater skill in the production of fruits and vegetables and at the exhibitions their products are of a more superior quality and better staged. I look upon the school garden movement as one of the most hopeful signs of the times and one which will help to turn the drift of population from the overcrowded industrial centres to the purer air, natural beauties, and greater comforts of country life.

I cannot close without expressing my high appreciation of the honor you conferred upon me by electing me president for a second term. I would that I had been able to do more to advance the interests of our association, which has been very dear to my heart, in a somewhat busy life. I have done the best I could. We all owe a great debt of gratitude to our faithful, courteous, earnest, and hard-working secretary, Mr. Ebel, who has now given us ten years of efficient service in his efforts to uplift the dignity of our ancient, honorable, and enjoyable profession.

A GARDENER'S THOUGHT.

THE gray drab of Winter months is made more endurable by the prospect of the return of longer and cheerier days, and may I venture to express the hope that our association, bound together by the ties of horticulture and mutual good will, may yet be the means of bringing about a better and brighter future for the sons of Adam's profession. Meetings where experiences and opinions are freely exchanged will, I trust, help to make us more proficient in our craft, more skilful workmen, and yet more worthy of sympathetic encouragement and help from our employers, thus proving to them that the money they spend on their gardens gives them more pleasure, and yields a better return than that which is spent on other hobbies and pursuits. Personally, I have to say, no trade or profession is more engrossing than gardening. Workers in factories spend their days doing the same task week in, week out, amid the noise and whirr of machinery. The shop assistant has little to vary his daily routine. The clerk is kept monotonously on the same stool at the same desk, often under conditions trying to health and temper. The gardener at least breathes pure air, with little risk to health. Each week brings some change of work. Each season has an added interest. Some may say, with truth too, "and change of worry." Still, with its worry, its drawbacks, and its hard work, none of us need to be ashamed to say, "I am a gardener." Let us do our best to prove we are such in the truest and fullest sense of the word.

"Taking no thought for the things of the morrow" finds no place in the gardener's lot. It is a case of everlastingly taking thought for the things of the morrow; living in the future, forming mental pictures of that which is to be.—J. J. Graham.

A Lesson on Grafting and Budding

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

PROPGATION by causing a portion of one plant to grow upon another, whatever may be the form which the operation takes, is collectively known as Graftage.

It may be said that graftage is never employed for the propagation of the species itself because seedage and cuttage are quicker and cheaper. Its use is to perpetuate and multiply that which does not reproduce itself from seeds and which it is not advantageous or profitable to grow from cuttings. Graftage may be looked upon as a secondary operation, because the stock, or plant upon which the operation is performed, must first be produced from seed or from cutting, and this stock is then grafted with the desired variety.

The term grafting is generally restricted to propagating by the use of short shoots, known as cions, and budding to the use of single buds.

Undoubtedly grafting is one of the oldest of the arts of plant culture, and it is alluded to as a common practice in the most ancient writings. It is probable that this art was held more or less a professional secret in the ancient world, but the ancients have left us abundant testimony that it was employed with success. Pliny describes some methods of grafting, and gives several precautions which today should never be lost sight of. The stock must be "that of a tree suitable for the purpose," and the graft must be "cut from one that is proper for grafting"; from a tree "that is a good bearer, and from a young shoot." "A graft should not be used that is too full of sap, no by Hercules! no more than one that is dry and parched," and so on, thus illustrating the fact that most of our current practice has its roots deep in the distant past.

Graftage consists in placing together a portion of two plants having a living cambium ring, in such a way that their cambium cells are maintained in intimate contact. While the growth processes immediately involved in budding and grafting are well understood, all of the relations between the stock and the inserted part are not so clearly defined. The important principle, so far as growth is concerned is to unite the cambium of the stock with that of the cion or bud. When held firmly in contact by grafting wax or tying material the cells of the two individuals thus united develop a callus, effecting a close union and wood is subsequently laid down by each contributing part, cementing this union completely. Plants which do not have a cambium ring cannot be grafted successfully.

If the operation is successful, growth will unite the two parts, and plant processes will go on much as if the parts had never been separated.

The more intimate the contact of the cambium in the parts brought together and the less injury their cells sustain throughout the operation, the more likely are they to unite.

In general, a union so intimate as to insure the life of the cion or bud is only possible when the plants are related.

In plants capable of being grafted or budded it will ordinarily be found that different varieties of the same species invariably unite; plants of different species of the same genus often unite; examples, pear can be worked upon the quince, peach on plum. Plants of different genera in the same family sometimes unite, as the pear upon hawthorn and the syringa upon privet. But plants belonging to different families rarely unite, and in any case the union is never permanent.

An apparent close connection between plants of different genera is not always a criterion that they will unite, as for example, the peach and the apricot do not readily join together, but both unite freely upon the plum, which differs from both much more than these differ from each other.

Another peculiarity which is manifested in graftage is that while many plants freely unite in one direction they will not do so in the opposite; thus, most pears unite freely upon the quince, but the latter does not do so upon the pear; orchard cherries unite easily with the wild mahaleb cherry, while the latter rarely, if ever, unites when worked upon the former.

The ways or fashions of grafting are very numerous. Thus Thouin in his *Monographie des Griffes*, describes one hundred and nineteen kinds of grafting, and nearly fifty methods have been described by modern American writers. In all methods the underlying principle is the same in every case, and the operator may fashion the method of union to suit himself if only he apply cam-

bium to cambium, make a close, air-tight joint and properly protect the work.

All kinds of graftage may be classified into three groups: (1) bud-grafting, or budding; (2) cion-grafting, or what is usually thought of as grafting proper, and (3) grafting by approach, or inarching.

Most people connected with gardening in its widest sense and who follow the various—sometimes antagonistic—opinions set forth by writers in the horticultural press, especially if those of various countries are compared, are aware that from time to time there have been expressions of opinion that graftage is both injurious and devitalizing to plants. It must be admitted that the prejudice against graftage was stronger in this country, as well as in other parts of the world, fifty years ago than it is today. Like almost, if not quite, every thing else, graftage may become an evil if misused or abused. In the case of ornamental plants especially, grafting may be very pernicious. Fortunately, owing to the new quarantine law we are no longer troubled with Holland grown Rhododendrons which were grafted upon the tender *pon-ticum* stock, with the result that they died out sooner or later. One or two nurserymen are now using the native *maximum* stock upon which to graft hybrid Rhododendrons which is a great blessing to those interested in hardy plants. Other plant raisers in this country are wisely discarding grafting in this connection entirely and are propagating by cuttings, and the more this latter method is followed where possible, the better. Another example of the misuse of graftage is that of working the syringa (lilac) upon privet, a practice which has, however, been discarded by the better class of nurserymen. Wherever it is possible without detriment to the object in view, plants should always be grown from cuttings rather than grafted, as in the case of cuttings, growth from the roots is always the same as the top, and therefore any accident to the latter can generally be renewed from the former. Amateurs and those who do not employ a professional gardener should invariably have roses upon their own roots rather than budded. This will avoid trouble from growth coming up from the stock, and the roses will not be so liable to die out, although very frequently the latter is caused by faulty planting, and want of care.

While grafted and budded plants should be avoided when possible, there are, however, certain ends which can only be obtained by the graftage method of propagation.

It can be used to change the character of a plant. Thus it is the means of producing dwarf fruit trees by grafting the apple upon the paradise stock and the pear upon the quince; this dwarfing enables these fruits to be produced in a small area and causes the trees to bear earlier.

It can be the means of overcoming adverse soil conditions. Plums, for instance, do not do well upon very light soil but they will thrive upon it when grafted upon the peach. The peach does better upon heavy soil when grafted upon the plum; the latter method will also prevent the ravages of the peach borer. In climatic where the peach is not hardy, the mountain ash is sometimes used as a stock for the plum upon light soils.

Modifications in flavor of fruits and their period of ripening may also be brought about by graftage. It may frequently be used as a means of increasing a plant's hardiness and of adapting a variety of species to an adverse climate. For instance, the extreme hardiness of the Oldenburg apple is made use of as a stock upon which to graft more tender varieties. In this case double grafting is performed. The Oldenburg being first put upon the ordinary crab or seedling stock and then the desired variety worked upon the Oldenburg.

It is thought that graftage sometimes increases the size of fruit, an example being that dwarf pears upon quince produce larger fruit than when grown as standards upon pear stocks.

The flavor of some fruits is undoubtedly influenced by the stock used in grafting, this is especially noticeable in the case of apples which are much more acid when worked upon the Siberian crab or ordinary wild crab than upon either seedling apple or upon paradise stocks. Some pears, notably the Angouleme, are much improved in flavor when grafted upon the quince.

Old orchards that have been allowed to grow in such a way that spraying and fruit gathering are almost impossible, or which contain poor varieties, may be entirely renovated by heading in the

(Continued on page 740)

Departments of Foreign Exchange and Book Reviews

DARKNESS AND THE RIPENING OF FRUITS

EXPERIMENTS carried out by Messrs. Gustave Rivière and Georges Pichard show that where the object of storing fruit in a fruit room is to delay its maturity and thereby enable its use to be deferred, darkness is important. The authors experimented with two small lots of the Apple Calville Blanc, exposing one to diffuse light and the other to darkness. At the beginning of the experiment (November 27), the composition of the fruit, as determined by analysis of a specimen similar to the fruits used in the experiment, was: total sugar 12.55 grams, glucose 9.25, and cane sugar 3.30. On February 12 of the following year, only those fruits which had been exposed to diffuse light were ripe. Those which had been kept in darkness were not ready until several weeks later. Analysis of the dark-kept and light-kept fruits showed that whereas the total sugar had decreased in both, it had decreased considerably more in the light-kept Apples than in those maintained in darkness, the amounts being:—total sugar in light-kept, 11 grams, in dark-kept Apples 11.85 grams. It is interesting to observe that the decrease in sugar which accompanied ripening was due almost entirely to a decrease in glucose. Thus, whereas the saccharose (cane sugar) fell from 9.25 grams on November 27 to 8.78 grams in the dark-kept Apples analyzed on February 12, it was so low as 8.05 grams in the Apples kept in the light. This is in conformity with what the plant physiologist would expect, namely, that glucose is the sugar which is used up in the course of respiration. It would seem to follow that respiration of fruit, such as Apples, is appreciably more rapid in light than in darkness and that light would, in some circumstances, be a useful aid in speeding up the ripening process. The decrease in total sugar in the kept fruits may perhaps surprise some people; but it is to be remembered that Apple fruits are living things, and, like all such things, they continue to use energy which they get by decomposing the sugars they contain. The other ripening changes, the softening of the cells, have for their result that the somewhat smaller quantity of sugar produces a taste of greater sweetness in the ripe fruit than the larger quantity does in the unripe fruit.—*The Gardeners' Chronicle (British.)*

GARDENS AND WATER

NO class of the community has been hit such hard, repeated blows by the prolonged spell of dry weather as gardeners. Whether their particular fancy was among flowers, fruits or vegetables, it has failed to realize expectations and, consequently, it has not sustained the reputation (often self-accorded) of its grower as an expert in this or in that among his friends. An ordinary drought causes a certain amount of perturbation, but it is not difficult to find means adequate to prevent complete failure, or even serious disappointment. The present period is not English—"it is not cricket." Week after week, month after month with no rain or not enough to be appreciable, resources were strained and finally broken—the plants had to take their chance.

Those who read as they run in their own or their friends' gardens will have learned one valuable lesson in every case, and a second one in many instances. The immense advantage of deeply cultivated, firm soil over that which is shallow, and perhaps loose, too, has been emphatically demonstrated. In the former the plants grew steadily and strongly for many weeks without extraneous aid; in the latter they ceased to advance much sooner, wilted badly and collapsed eventually.

The supplemental steps taken immediately that the soil approached total dryness took the form of a very heavy watering, pointing shortly afterwards, and finally a mulching of short manure, lawn clippings or fine, dry mould. Later, when dryness was again imminent, came the removal of the mulching, a second soaking, pointing over and the replacement of the mulch or a fresh supply. This process, continued as necessary, carried the crops to a finish. In the case of shallow ground the treatment ran on identical lines, but because of lack of depth for the roots and to hold moisture the drying-out was much quicker. The persistent application of water kept the soil so cold that the roots gradually perished, and following that came the death of the plants. The lesson learned is that very deep, firm soil does not dry out rapidly, whereas shallow, loose soil does so.

Correct watering is, perhaps, the most difficult detail of gardening to master. The secret lies in giving applications only when they are required to maintain sufficient moisture in the ground for the plants to feed. Considered judgment must decide the duration of the intervals. In the case of plants in pots the sides

can be rapped sharply with the knuckles or a small mallet. If the note in response is clear, water is needed; but if it is dull, none must be given. After a little experience this test may be accepted as infallible, provided that the drainage is in perfect condition. Out of doors this course of procedure is obviously impossible. The decision must be based on the appearance of the leaves or on a soil test at a depth of about six inches, and the latter is the more reliable and, incidentally, the more trouble. Take out the soil to the depth of an average trowel; if it is dry at the bottom, give water; if damp, withhold it.

The quantity of water given at one time is of paramount importance as far as plants in the garden are concerned, but not so much so to those in pots, since the grower has substantial control here. The bulk of water used in gardens comes through mains in these days; it varies in quality (for plants) and it is generally exceedingly cold. As regards the quality, the gardener has no alternative to using it when a supply is imperative, and the result is usually satisfactory, though some plants may be checked for a brief season. The coldness is always prejudicial, and it will be to an innocuous or a dangerous degree according to circumstances. There must be an immutable law in garden watering. When the soil approaches dryness apply enough water to moisten it to a depth of nearly three feet, and give no more until it approximates to total dryness again—the interval may be a week, a fortnight, a month, a year, its duration is of no importance. When main water is used the temperature of the best soil will be reduced by about two degrees, which will be recovered almost during the day following an evening soaking, and unless there is something peculiarly objectionable in the quality, no harm can result. Suppose, however, that instead of the occasional soaking directed by intelligent judgment water is given from a main each evening. The original loss is put at two degrees; the recovery the next day is not quite complete and, consequently, the temperature will fall slowly lower until the soil is so cold that the plants cannot feed—they die from starvation. Such watering is a folly in which too many amateurs indulge and it cannot be depreciated too strongly. The point can be demonstrated in any garden by choosing two plants of the same kind growing under precisely the same conditions, but far enough apart to ensure that the treatment of the one cannot influence the other. Do not give water to one unless the soil is dry at a depth of six inches; give enough water to the other to soak in two inches, each evening; the former will flourish and the latter will die in a fortnight, or three weeks at the most. Far different from regular soil watering, and always beneficial in hot weather, is evening syringing of the tops of the plants in which the quantity reaches the ground will be too small to affect the temperature either way.

In all circumstances it is necessary to assist in the conservation of soil moisture. The simplest means is incessant shallow hoeing or pricking over to encourage a surface layer of dust, perhaps two inches thick. The capillary tubes are then broken and there can be no waste, while there is the inestimable benefit that it is impossible for weeds—interlopers and robbers in a garden—to establish themselves. The second step to preservation is mulching with short manure or lawn clippings, and it is unquestionably the better; but all gardeners are not, unfortunately, in a position to adopt it owing to lack of suitable material.

There is one other aspect of soil watering which may be treated of before the subject is dismissed—it is in relation to beds specially prepared for seeds, including Cabbages, Onions, Spinach, Turnips and others, which must be sown when the ground is, even in normal seasons, hot and dry. It is impossible to get a perfectly dry soil down as fine and firm as it ought to be for this purpose, as, indeed, it must be if success is to be achieved. Therefore soak it heavily once or twice as required in advance of sowing and do not give any more water until the hour of necessity, which ought not to come before the seedlings are through the surface. Similarly, when seedlings have to be transplanted in dry weather the sites should be watered beforehand, as dry soil will draw moisture from the roots and cause the plants to wilt seriously and perhaps die. Except for limited areas where very small seeds are to be sown, all stones must not be removed, as they tend to keep the surface cool and moist.—*The Garden.*

WILD CHERRIES AND BLACKBIRDS

THE Wild Cherry or Gean (*Prunus Avium*) is not planted as freely as it might be for esthetic effect. It is a beautiful sight in Spring when covered with blossom, especially if seen

against a dark background, such as can be afforded by Scots Pines. In Autumn, it is one of our few native trees to show bright orange and red foliage, which likewise stand out well in relief against the deep blue-green of the Scots Pine. But my main object in writing this note is to point out an additional advantage this tree possesses, viz., as a counter-attraction to blackbirds from cultivated fruit. This fact has been brought vividly to my notice this Summer. Suddenly these birds ceased from troubling the garden berries. I discovered that their attention had been turned to the ripening fruit of the Wild Cherry trees growing in the vicinity. For a full fortnight they were almost wholly occupied with them. Apparently wild Cherries form a superior attraction to cultivated soft fruit. The same change-over was very noticeable at another garden in this neighborhood. In this instance the Cherry trees are situated more than a quarter of a mile away; yet the blackbirds forsook the garden for several days to devour the wild fruit. A fortnight's freedom from these birds at the height of the Strawberry season is a great blessing. Hence for this reason alone the planting of wild Cherry trees in the vicinity of gardens is desirable. They are easily raised from the fruit stones, grow rapidly and are very accommodating as to soil. It is not a small tree, either, as some writers might make us imagine, for specimens will attain to the size of forest trees, and produce timber of value to cabinet makers.—*The Gardeners' Chronicle (British.)*

FUNKIAS: BEAUTIFUL PLANTS FOR SHADY POSITIONS

PRE-EMINENCE is, generally speaking, given to the sunny side of the garden, and plants which thrive in the light and come to full beauty in time of bud and blossom are studied and arranged for from the point of view of color effect and suitability. It is the "sunshine line" which appeals to most folk. We are constantly being reminded that such and such plants "love the sun," and so it has come about that the shady places in our gardens and their possibilities of beauty are not thought out or considered with the same degree of interest.

But the place where the shadows fall for the longest, as well as the sunny quarter, may be made attractive, suggestive of coolness and quiet and restfulness during the days of Summer. Sometimes it is the least inviting spot in a garden in the matter of plants—the neglected and often uncared-for position—which is the very test of the gardener's capabilities. Just as some great landscape painter is able by certain deft finishing touches on the canvas to impart life and beauty to the scene, so the gardener-artist sees in the least-regarded portion of the ground great possibilities, and, with that before him, works until his ideals are achieved, and sombre and hitherto uninviting surroundings are, by the use of the most suitable subjects, transformed. He creates a scene of beauty where little or none existed before.

We do not go so far as to say that the number of plants which thrive best in the shade is unlimited, but we would remind anyone interested of one hardy subject at least, valued for the beauty of its foliage and flowers, too. It is the *Funkia* or Plantain Lily, a lover of shade and moisture, one of the prettiest plants in early Summer when seen in all the freshness of its new dress, a plant that is not averse to growing under trees so long as they are not allowed to rob it of the elements of the soil.

As we have said, they are hardy—so hardy, in fact, that in all our experience of them we do not remember a Winter when frost hurt them to any very great extent, or when the covering of leaves which we gave did not suffice to protect them.—*Irish Gardening.*

DEPARTMENT OF BOOK REVIEWS

The Little Garden. By Mrs. Francis King. Atlantic Monthly Press, Boston.

The soul of a garden cannot be more pleasingly embodied in description than it is within the less than one hundred pages of this attractive little volume. Through it are expressed the mature sensibilities acquired by one who has long made such a study of the harmonious arrangements of flowering plants that she could compose that appropriately named book, *The Well Considered Garden*. This new work is imbued with the spirit that might be expected to arise from service as the honorary president of the Women's National Farm and Garden Association. Though most valuable for giving improved ideas of color arrangement, a subject to which a chapter is devoted entirely, it suggestively

and in a fairly practical manner relates the ideas of other recent writers on the designing of gardens of not large scale. Several helpful charts, some of them original with the author, are contained in the volume.

Come Into the Garden. By Grace Tabor. Macmillan Company, New York.

The contents of this neat and tastily-made little volume are quite in keeping with its form. In it are lucidly and attractively set forth the principles and details of planning and constructing homes and gardens upon city lots that are measured by square feet—a field slighted by writers of books on landscape art in general. The enclosing walls, by which such lots of necessity are usually hemmed in, are found an advantage. Miss Tabor declares that she "cannot too earnestly express the belief that nothing worth while will ever be done with suburban or any other gardens until we restore the fences and walls so ruthlessly torn down and abandoned around the latter quarter of the last century." The solutions of the practical difficulties resulting from limitations of space are eminently sensible and happy. There is shown what at first blush might appear preposterous and altogether hopeless, namely, how, even within such straightened confines, may be enjoyed the charms of the "outdoor living room." The owner of the small city lot need not abandon thoughts of having his own trees, evergreens, shrubbery, vines, roses and other flowers, nor even fruit trees and bushes, a vegetable garden, a rock garden, a wild garden, water features and water flowers. Here is given, very clear and very sane, directions also for cultivating them all.

The author's experience tells in the nice selection of the materials she advocates; she eliminates discreetly and cautions judiciously.

The Flower Art of Japan. By Mary Averill. The John Lane Company, New York.

The author of this work has been doing valuable service by interpreting to lovers of flowers the world over the genius of that people among whom have existed for 700 years clearly recognized schools of flower arrangement. To Occidentals it is strange indeed that in the one city of Kyoto alone there are forty teachers of the art adhering to one school, and strange that there is a regular ceremony of arranging flowers. The invited guest enters the room of a home where there is a carefully and scientifically studied arrangement of a few sprigs of flowers or tree branches, with all surroundings carefully appointed. After judging his host's attainments in the art—he displays, by trial, his own.

There has naturally grown up an elaborate system of symbolism. There have been developed, as might be expected, methods of making flowers last well. Stems of all are cut under water; the stems of the lotus, as is practiced among us in the case of the Oriental poppy and of other very evanescent flowers, are plunged immediately into boiling water; the blossoms of all water-loving plants are kept fresh longer by forcing a little salt into the stems and standing them in warm water or weak tea, which is used for flowers of other kinds, also; flowering fruit branches and those of dogwood, etc., have the bark bruised where it will be under water.

The many illustrations, at first sight of apparently no significance, repay study by the suggestions that gradually evolve from them.

A LESSON ON GRAFTING AND BUDDING

(Continued from page 738)

trees and inserting grafts in the stubs of the branches. It is not, however, worth while to do this unless the trees are sound.

Grafting with a cion is invariably used for trees of any size, and on branches in the case of re-grafting old trees, but for seedling stock buds are used; the latter being also always used for roses.

In selecting cions or buds for fruiting stock we must not forget Pliny's advice to take them from good bearing trees. It is to be feared that this point is not always given full consideration by fruit-tree raisers. I am inclined to believe that, in the case of apples especially, failure to bear is due to want of care in selecting cions and buds.

Grafting by approach, or inarching, has been mentioned. This is Nature's method and examples of it may be frequently seen in woods and forests, as well as in other places where related trees are growing together. In ordinary practice this method is not now much used, although it was a favorite way in private gardens, especially in connection with plums. For this purpose a seedling is planted under an older tree of the desired kind, and a branch, preferably about the same size as the seedling, is joined to the latter, the barks being removed between the stock and the cion, and both waxed and tied snugly together. If the operation is performed in the Spring the branch may be severed in the Fall and the resulting young tree planted in its permanent position, provided a perfect junction has resulted.

National Association of Gardeners

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1922 CONVENTION, BOSTON, MASS.

Officers for 1922.

Robert Cameron, President.
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1921 CONVENTION REPORT.

TUESDAY AFTERNOON SESSION, OCTOBER 11, 1921.

The meeting convened at the Park Avenue Hotel, New York City, Tuesday afternoon, October 11, T. A. Havemeyer, President of the Horticultural Society of New York, presiding as Chairman.

CHAIRMAN HAVEMEYER: In calling this meeting to order I wish to thank you for the honor conferred upon the Horticultural Society of New York by inviting me to preside at your meeting. I think your Association deserves a great deal of credit for having invited members of the various horticultural societies to be present here today. I think that the co-operation you have shown will be a great benefit to horticulture.

We have with us today James Boyd, President of the Pennsylvania Horticultural Society, and a great lover of plants. I am sorry to say that A. C. Burrage, President of the Massachusetts Horticultural Society, is unable to be present.

We also have with us today Mrs. Samuel Sloan, President of the Garden Club of America, which I personally think is doing more for horticulture today than any other society. I take great pleasure in presenting Mrs. Sloan, President of the Garden Club of America.

Mrs. Samuel Sloan Welcomes Visitors

Mrs. Sloan's address appears on another page.

We want to stand for the very highest and best there is in hor-

ticulture and we know we can get your help. Again I want to welcome you to New York and I wish that my own place was one of those you could visit. Although I love it, it would not be of interest to you, but I know you are going to visit some wonderful places in the next few days.

I wish to congratulate you all in having this wonderful organization which is doing so much good work throughout the country.

CHAIRMAN HAVEMEYER: I have much pleasure in introducing Mr. Head.

Thomas W. Head Speaks

THOMAS W. HEAD (Red Bank, N. J.): Mrs. Sloan, Fellow Members and Friends: I wish to thank you on behalf of the National Association of Gardeners for your kind welcome to this city, and I can assure you we will take advantage of all the opportunities offered us by visiting these various places. We appreciate your kindness very much.

One thing I noticed Mrs. Sloan spoke about particularly was the co-operation with the employers. Although this is not the time for discussion, because that will come up later, I would like to say that that is something we are all working for. We are trying to co-operate with our employers and with the various clubs and so on. Without such co-operation how can we expect to get along? How can we expect to have the estates of our employers prosper under our supervision unless we have such co-operation?

Sometimes the employers wish to pull the garden to pieces. If it is their hobby and their pleasure let them do it as long as they are willing to pay for it. Let us always try to co-operate with our employers. Sometimes it is embarrassing to us when a lady or gentleman has something they want changed or something they think should be improved and when they get through there are no improvements at all. Perhaps such occasions are lessons to them.

I want to say again that it is co-operation that we are always trying to give our employers and I think you will all agree with me that that is what we are there for. Without it I don't see how we can get that restful feeling that we ought to have on the places and on these beautiful estates.

I wish to thank Mrs. Sloan for the kind welcome she has given us and I am sure we all will learn something from visiting these beautiful estates. Undoubtedly we could learn something up at Garrison, for we are always willing to learn and there is a chance on the small places as well as on the large. However, our time is limited and we will only visit these large estates, although I am sure we could get much valuable information from the smaller ones.

I wish to thank you again for your welcome extended to us.

CHAIRMAN HAVEMEYER: I have much pleasure in introducing W. N. Craig, President of the National Association of Gardeners.

President Craig's address appears on another page.

I want to say that the George Robert White Gold Medal for Horticulture was this year awarded to Mrs. Frances King of Alma, Michigan. This was the first time the medal had been awarded to a woman. Mrs. King is one of the greatest supporters of horticulture and is known for her great work in gardening, her lectures, for the formation of clubs and for her books.

CHAIRMAN HAVEMEYER: I have great pleasure in introducing to you at this time James Boyd, President of the Pennsylvania Horticultural Society.

JAMES BOYD: Mr. President, Ladies and Gentlemen: It is a great pleasure to be here this afternoon and speak to you. Your Secretary asked me to address you on the subject of sign boards. I am very much interested in that subject, although I know very little about it. I might have spoken to you about plants and flowers to a little better advantage, but since your Secretary invited me to come here I have talked to a great many friends and asked their opinion in regard to sign boards and I shall be glad to tell you what I have learned.

James Boyd's Address on Sign Boards on Another Page

CHAIRMAN HAVEMEYER: I am sorry to say that Mr. Eastman of Cleveland will be unable to be present today. G. H. Pring will make some remarks along this same line.

G. H. Pring on School Gardens

G. H. Pring (Vice President N. A. G.): It was the least of my expectations when I left St. Louis that I would be called upon to address this convention instead of Mr. Eastman.

I am sorry to say that it is impossible for me to give you any direct statistics of the work being done in Cleveland. I will try to cover the subject, generally speaking. I had the pleasure of being at the Cleveland Convention when Mr. Eastman as Garden Supervisor was directed by the Board of Education to visit our convention and to ask for some assistance in the direction of the work in Cleveland and the possibilities of improvement.

A committee was appointed. I was selected as Chairman and the matter was taken up with the Board in general and also with Mr. Eastman. The Committee reported with its recommendations which of course you have read through the medium of THE GARDENERS' CHRONICLE.

It was probably due to that report that I was called to Cleveland to start the first Summer course in gardening, or as we term it, horticulture. When I arrived at Cleveland I found that the students were composed of teachers or various garden supervisors. There were about forty-five teachers in the class doing school garden work during the vacation period.

There are two main tracts which are worthy of mention. One is the so-called West Tech Tract which comprises the West Technical High School and the surrounding grounds, and the other is the John Hay Tract which is in the eastern part of Cleveland. The John Hay Tract is a combination of both flowers and vegetables. It is probably about two acres in extent and is laid out in up-to-date lines. The old-fashioned idea of having little two by four plots for individual children is done away with. Everything is planted in straight lines and the children have their special lines to work. There is a gardener in charge of the tract who is absolutely responsible for the practical teaching of the children. In addition there is a school teacher designated for a certain section.

In reference to the West Tech High School and gardens there is ornamentation around the High School which is partly taken care of by the children. There is also the West Tech Greenhouse, which is about seventy-five feet long and somewhat antiquated. I am speaking, of course, about last year. There the children are allowed to take their various courses in plant propagation and various other subjects relative to plant growing.

There are probably between thirty and forty outside frames where various vegetables are raised in the Spring. Probably about two acres are under cultivation for various farm crops and a gardener is in charge. All the vegetables grown at West Tech are turned over to the so-called commissary department.

The latest report from Mr. Eastman is that there will be a complete new range on this West Tech ground. I understand this range will cost approximately \$40,000.

I think that covers the subject as far as I know at the present time. I am sorry that I did not know sooner that I was going to be called on, because I could have prepared some figures to present to you.

CHAIRMAN HAVEMEYER: Discussion is now in order. Does anyone wish to address the meeting?

MRS. SLOAN: I would like to ask whether the boys like the work well enough to go on with it, or whether it is just temporary while they are in school?

MR. PRING: I think Mr. Eastman has tried to direct as many as possible into the profession. He claims there are quite a few following it up—principally from the foreign element.

Robert Cameron on Quarantine 37

CHAIRMAN HAVEMEYER: Robert Cameron is here. I wish he would say something in regard to Quarantine No. 37. I understand he has something to say on this subject.

ROBERT CAMERON: I have very much to say. I am in favor of Quarantine and Mr. Craig is not. I think it is the finest thing in Quarantine we have ever had in this country.

I have looked through all the catalogs that are printed in New England of every nurseryman who has anything to propagate and has plants to sell and there are no Elizabeth Campbell phlox. Why? Because we imported them. Don't we need a quarantine? What did the war bring about? Didn't we produce a lot of things that we did not have before? Now, our nurserymen are producing them. How are private estates to be made now? The owners won't make them. Prices are too high from the nurserymen. I just want to open the discussion so that we will hear the other side. That is my viewpoint. We have got the quarantine and we want the quarantine still harder.

We have the corn-borer in Massachusetts in almost every section today. States will be quarantined shortly so we can't send things out and that will be hard. If we only had had quarantine years ago we would not have these pests. There is now a chance for more discussion. (Applause and laughter).

CHAIRMAN HAVEMEYER: There are a number of nurserymen here and I would like to hear from them.

MR. ATKINS: Of course, it is generally understood that nurserymen have worked a little trick and they have just turned Quarantine No. 37 into a high wall, so they can get various plants for themselves. Now, Quarantine No. 37, as our friend, Mr. Cameron, says, is, no doubt, the best thing that ever happened to horticulture in this country. I would like to say we have never had horticulture here, it has been largely from Europe. Mr. Cameron just told us he could not find Elizabeth Campbell phlox because we used to import thousands of them, and so with all kinds of phlox which we used to import. Now we take our roots and keep them and pick our plants and have tens of thousands of them to sell. We are going to have by Quarantine No. 37 a distinctive American horticulture.

When I was a boy (I was born in England) we were proud of our horticulture there; where I was apprenticed on Lord Dudley's estate we had a very large institution and used to buy as many as three roses at one time of one variety and then what happened? We boys were taught to propagate them and all other things in a similar manner. That is what is going to happen in this country. One time from three million to four million roses were brought here from various parts of the world and what happened to them? They went into our great stores and sold for at least two for a quarter.

This year many men and boys are employed in the country from \$5 to \$15 a day budding roses. It is an American industry, I understand, not European. Now, speaking of young fellows learning the nursery trade and gardening trade, how could they learn if everything was produced in Europe by young Europeans? They learned the business and stayed over there and got our money instead of having something here to induce our young men to go into the business. We had 160 boys, but we don't expect to get all these boys to come into our enterprise. Sooner or later some are going to do it, because we have quarantine which enables us to produce hundreds of thousands of plants which we were not producing before we had quarantine. There is going to be no end to the benefits.

Developing an American Style of Horticulture

MR. STEWART (of Massachusetts): I meant to ask Mrs. Sloan a question as to what the Garden Club of America is doing toward developing an American style of horticulture. We have too many Italian, Grecian and English styles of horticulture which demand various foreign plants which we are compelled to use and which are a nuisance to the gardener. We have to coddle and coax them. I should like to see our native American plants taken up and an American style of horticulture developed in this country. There is no reason why it should not be done. We have everything to do it with and there is no use importing unhardy plants which require twice the work to look after when our beautiful American plants would do. I would like to ask Mrs. Sloan if the Garden Club of America is doing anything along that line.

MRS. SLOAN: There is a feeling that we must plant American-grown plants or things that will grow better in America rather than to import things from Europe. I think we are realizing that we want to hibernate the American plants, in landscape effects and all that. The English gardens would be very much like American. This, I think, depends upon our climate. It varies in different parts of America, so we can't always follow that.

Italian gardens are more or less green; no flowers are used comparatively in the Italian garden. Potted flowers are a great help in giving a bit of color and our very dry season with very great heat do not destroy them, as they can be brought back or other ones put in their place. That is one of the great charms of the Italian garden. Possibly it might become an explanation of why we are doing so much Italian gardening. That is really the reason, because if the Summer is absolutely dry you can't have any effect. Is it not better to have a beautiful green effect of some green things than a few measley flowers? I think that the only plea I can make for the Italian garden is that one. I think it should be all plain common sense planting; not Italian, English or anything else, but what we all call American common sense. If we want the right thing we will get it there. If it is Italian, or English, or French, it really does not make any difference as long as we get the right thing.

Cause of High Prices for Roses

MR. BOYD: I would like to ask Mr. Atkins a question. I believe he is Vice-President of the American Rose Society and that society is very much interested, and has been for years, in placing roses in every home. Now, if they are going to pay young men \$5 to \$15 a day for budding roses, roses are not going to be within the reach of the working man for many, many, many days.

MR. ATKINS: I think as we find the true method of cultiva-

tion for roses, there will be no doubt about this. I am told, after an ordinary Winter, the circumstances in Europe only represent sixty per cent. of the original budding. But on the other hand, those people are using *manetti* roses which have no value in our climate. The American nurserymen, or the Eastern ones who are budding roses, use the up-to-date stalk of the *multiflora*. The American roses have practically no stem today; they are budding on the root.

Now then, when we get to teaching these young men from time to time they will become great experts in budding. As labor conditions change they will work probably for \$3 or \$4 a day instead of getting as I said from \$5 to \$15. Then the prices of roses are going to come down. Everything leading up to the present cultivation of roses has been brought about during the period of high prices. Don't expect either to buy up-to-date nursery stock of rhododendrons or evergreens for a song for the next year; you are not going to do it any more than you are going to buy the roses. Prices are going to be just as cheap as they possibly could be. Taking Europe, for instance, I want to ask if, in several sections where they are growing commercial roses, five shillings is cheap?

We have this year imported two hundred and some odd varieties of roses and have paid as much as three and four pounds for them. I want to know if we wouldn't like to produce roses in this country at such a price. We will be glad by and by to produce hundreds of thousands of them for fifty, sixty and seventy cents a piece.

CHAIRMAN HAVEMEYER: Can't we hear from somebody else?

More About Quarantine 37

PRESIDENT CRAIG: Mr. Cameron, the first speaker, is as strongly opposed to Quarantine No. 37 as I am, but at any meeting where I say something he takes the opposite side. Now he is just as aware as I am that there are quantities of Elizabeth Campbell phlox to be had in Massachusetts. Mr. Atkins' arguments are all in favor of Quarantine No. 37. He admits they will sell roses at three for a quarter when they are popularized in stores. He does not tell you that they ask one dollar for one now, which will not popularize them. Furthermore, he says that the stocks these roses were budded on were unsuitable. We have roses which we have tested out and they are just as vigorous today on *manetti* stocks and are just as suitable as the *multiflora*, he recommends. Nurserymen are coming around to view Quarantine No. 37 somewhat differently. They say now: "Here is a chance to shut out all foreign importations. Here is a chance for us to make good. Here is a chance for us to charge \$5 for a plant that is only worth \$1 and soak the big people for it."

They tell us plants have brought in mealy-bugs, scales and red spiders and cattleya flies. They say these flies came in on orchids, but in some cases they were here before we grew any orchids. Now orchids are entirely debarred and why? No reason for it. Some of our producers here are raising quantities of orchids and are trying to lead us up. Many beautiful flowers which ought to come in here cannot. Now are you going to debar everything to build up an American horticulture with a miserable and bad choice of subjects?

Mr. Atkins is going to propagate, he says, thousands of roses and rhododendrons. Probably others are also. Well, they want to compel people here to buy the certain things which they can propagate most easily and in greatest quantities. That is not broadening horticulture, that is stultifying it. I say we ought to adopt a measure here to permit individuals as well as nurserymen to bring in, if they want, what is raised by the best efforts of European horticulture. They are just as skillful and, perhaps, more skillful than we are. We have no one here to do the work in horticulture that Le Macuse has done for France. A wealth of peonies and quantities of other plants and bulbs are all debarred now. These are all debarred except certain ones when nurserymen bring them in and propagate them for general public use. We are likewise denied many beautiful things from Corea, Manchuria, China and Japan.

Now, what is the sense in admitting tulips, daffodils, lily-of-the-valley and such, and debarring those innocent, lovely, harmless China phlox, *Achillea*, Spanish Iris and English Iris. They have never been known to bring in any pests so why debar them? The whole thing is utterly wrong and narrow. If the policy were carried out to the letter it would simply prevent all export trade. I think that the thoughtful and intelligent horticulturists will all agree with me that we ought to let the bars down and allow Nature's beauty to come in so as not to inflict any hardships on our fields, forests and gardens. We can't put the bars on the corn-borer. He has gotten into Ohio because he was blown over the whole of Lake Erie. You can't quarantine the winds and the corn-borer came in a bundle of hemp. You can't quarantine hemp.

I can't see how anyone could be so narrow as to debar all our good, new and interesting things from the general buying public simply because certain commercial interests here hope to in-

crease production and sell their products eventually at higher prices.

MR. CAMERON: What is the Western point of view?

MR. PRING: We do not favor it; we want it moderated. I was very much pleased when Mr. Craig mentioned orchids; that is my particular hobby, or one of them. During my connection with the Missouri Botanical Garden we have imported orchids for a few years and have been trying to locate the so-called dreaded cattleya flies. I found by the systematic use of cyanide of potassium gas that the insect would be eradicated within six weeks. That is one of the greatest orchid pests. Orchids are not allowed to be imported in this country without a special permit. We have not imported any since Quarantine No. 37 came into prominence. Previous to that we would import various tropical plants, especially those which would impress the people by their economic value. Now we have to go through so much red tape we would rather not try to import them.

As regards the propagation of rose cultivation and rhododendrons, I am afraid I can't enter into that argument with Mr. Atkins because we can't grow them in our section of the country.

MR. STEWART: How does Mr. Pring fumigate per thousand feet for the cattleya fly?

MR. PRING: I use 2-2-2, which is 2 oz. water, 2 oz. sulphuric acid of good percentage, 2 oz. cyanide of potassium, to 2,000 cubic feet of air space. If you let that dry you will kill the flies. Prevention is better than cure when the cattleya fly or any other disease is around.

PRESIDENT CRAIG: Before we adjourn I think we owe a debt of thanks to Mr. Havemeyer, Mr. Boyd, Mrs. Sloan and others for coming here today and talking to us in such a practical way. I think we ought to have a rising vote of thanks for those who came here today and gave us such interesting talks. Does anyone make the motion?

A motion was made and seconded that a rising vote of thanks be extended to Mrs. Sloan, Mr. Havemeyer and Mr. Boyd for their kindness in coming and addressing the meeting. The audience arose and applauded, following which the meeting adjourned.

WEDNESDAY MORNING, OCTOBER 12, 1921.

The meeting convened at ten o'clock, President Craig presiding.

PRESIDENT CRAIG: We will call for the report of the Secretary as the first order of business for the day.

Secretary's Report

Notwithstanding the many prophecies following the increase in dues voted at the St. Louis convention last year that the association would suffer a severe loss in membership, quite the opposite has happened. The association received less than 40 resignations due to the increase in dues and secured 145 new members, also 49 sustaining members.

The association was, however, not so successful in some of the undertakings it had planned due to the general unsettled conditions of the country, but these have been only temporarily suspended, and just as soon as the time is ripe they will be taken up again.

The various committees have labored faithfully to carry out the work assigned to them, as will be indicated by their reports.

The co-operation that the Gardener's Association is receiving from other horticultural organizations indicates that the work of the last ten years has not been without its fruitful results, and efforts continued in the present direction for the next two or three years will gain for the association recognition among country estate owners as the influential body in the gardening profession. This will prove so if we can obtain the co-operation of the individual members to secure publicity for the association, whenever the opportunity presents itself by discussing it.

A successful local branch was organized during the last year in Nassau County, L. I., and a movement is now on foot to organize a similar branch in Westchester County, N. Y. A California member visited the office a few weeks ago on his way from Europe and on his return to the Pacific Coast with the intention of organizing a Pacific Coast branch. The more of these branches we can have the more good can be accomplished for the profession they represent.

At the New York Spring Flower Show the association maintained a booth, the benefits of which were not immediate, but are making themselves felt today by people who became acquainted at that time with the existence of the organization.

The most active department has been the Service Bureau, though, unfortunately, many members have been disappointed because they could not be aided, the trouble being that there were a great many more gardeners looking for positions than positions offering. There appears to be some good cause for optimism that conditions will change in the near future and that they will improve in the gardening profession. Of course, the gardening profession had to suffer with all other lines of business, but I believe it will be one of the first to recover.

The Sign Board Committee, which has distributed about 20,000 circulars, has brought quite some publicity to the association from different parts of the country.

A recent editorial which appeared in one of the Western papers on professional gardening brought many letters to the Secretary's office from young men, having passed through schools and colleges, who decided after reading what the editorial had to say about professional gardening, that that would be a work they would like to engage in, if they could be located in a position where they could study.

I feel that this report would not be complete if I did not refer to the able way in which the association's affairs were looked after by my assistants during my absence of four months from the office this Spring, due to sickness, I at times being in such a condition that I could not be consulted.

PRESIDENT CRAIG: You have heard the reading of our Secretary's report. Are there any remarks? If not, those in favor of accepting the report as read will kindly signify by saying "aye." Contrary? The motion is carried.

President Craig: We shall next hear the secretary's financial statement.

SECRETARY'S FINANCIAL STATEMENT

New York, N. Y., Oct. 10, 1921.

RECEIPTS.

On hand, Sept. 10, 1920.....	\$620.43
Received for delinquent dues	22.00
Received for 1920 dues.....	428.00
Received for 1921 dues.....	4,626.00
Received for life memberships.....	350.00
Received for 115 sustaining memberships.....	1,150.00
Received for Service Bureau Fund.....	70.00
	\$7,286.43

EXPENDITURES.

Deposit vouchers to treasurer Nos. 197-215....	\$5,394.00
On hand	892.43
	\$7,286.43

Expenditures of the Secretary's and Service Bureau office from August 24, 1920, to October 1, 1921, have been as follows:

Postage	\$149.10
Telephone and telegraph	209.90
Stationery	18.85
Office incidentals	58.95
Clerk hire	1,145.00
Expenses of Secretary	328.65

Total

M. C. Ebel, Secretary.

President Craig: You have heard the reading of our secretary's financial statement. Are there any remarks? If not, those in favor, signify by saying "Aye." Contrary, "No." The report is accepted. We shall now hear the report of the treasurer:

TREASURER'S REPORT.

Englewood, N. J., October 10, 1921.

RECEIPTS.

Balance in bank, Sept. 10, 1920 (Gen'l. Fund)...	\$1,664.75
Balance in bank, Sept. 10, 1920 (Reserve Fund)...	367.06
Deposit vouchers, Gen'l. Fund, No. 197 to No. 215.	5,394.00
Interest, General Fund	23.18
Interest, Reserve Fund	22.44
	\$7,471.43

DISBURSEMENTS.

Vouchers Nos. 300 to 352; 355, 356, 357; as follows:

Chronicle Press, Inc., subscriptions.....	\$1,521.00
Chronicle Press, Inc., office rental (Sept., 1920-Oct., 1921)	325.00
Chronicle Press, Inc., printing proceedings St. Louis convention	102.00
Advertising account, Service Bureau.....	250.00
Robert S. Dennison & Co., printing and stationery.....	197.95
Madison Eagle, printing	50.00
M. A. Brennan, reporting St. Louis convention.....	75.00
Barnett & Draddy, multigraphing	2.25
Metropolitan Letter Co., multigraphing	4.05
Diedges & Clust, medals	63.50
International Exposition Co., rental space at Flower Show	212.00
Merchants & Mfg. Exchange, rental furniture for Flower Show	49.00
Maurice Bateman, gold lettering	3.00
Appropriation voted to Secretary.....	1,000.00
Expenses of Secretary's office and Service Bureau.....	1,910.45

Total disbursements

Balance in bank, Oct. 8, 1921 (Gen'l. Fund).....

Balance in bank, Oct. 8, 1921 (Reserve Fund)....

1,706.23

\$7,471.43

INVESTMENTS.

Third Liberty Loan Bond.....	\$1,000.00
Peter Duff, Treasurer.	

President Craig: You have heard the treasurer's report. If there are no remarks, those in favor, please signify by saying "Aye." Contrary, "No." The report is accepted.

We will next have the report of the Committee on Service Bureau.

Report of the Committee on Service Bureau

The Service Bureau has had a busy year, though its accomplishments have not been just what may be desired, due to general business conditions and the lack of demand for efficient gardeners. There have been many calls during the year for handy men and for gardeners who had wives that might serve as cooks, but, of course, the Service Bureau was never interested and did not attempt to fill such positions, explaining to the inquirers that our interest is entirely in professional gardeners, and only such.

The advertising of the past is still manifesting itself among estate owners, for calls have come to the office from all parts of the country for skilled men. The most important development, however, is that when gardeners hear of a position and apply they are frequently asked if they are members of the National Association of Gardeners and whether they can refer to the association for references. This has recently brought a number of men to the office who had not been members before, but who have discovered that to be regarded as a professional gardener it is becoming necessary to belong to the national association.

There are indications that a change for the better is at hand. Many of the trade interests that cater to the estate owners for improvement and construction work are reporting an increasing number of inquiries, and feel sure that this coming Spring is going to see renewed activity on many estates. The general slogan this year has been "Go slow, keep expenses down," but we feel optimistic that a change will soon be at hand.

Many estates have been bought on which no work has been done and which are still in carekeepers' hands, and these, of course, will offer opportunities for some gardeners when work is commenced.

PRESIDENT CRAIG: You have heard the report of the Committee on Service Bureau. Are there any remarks on this report?

MR. GRAY: How many positions were filled this year?

MR. EBEL: I could not answer that without looking it up, Mr. Gray; I could not answer that offhand.

MR. STEWART: I would like to call attention to a fact that is worth taking notice of, that is, the standing that the National Association of Gardeners seems to give to the professional gardeners. The reference made in the report in regard to people asking if they were members of the Association is most important and I think that is going to be a splendid thing in the coming days. A committee might be appointed to look after that part of the work, to state whether a member is worthy or not of getting endorsement from the Association.

MR. PRING: I certainly agree with the last speaker in emphasizing the point that the National Association of Gardeners stands for the best of the professional men in the country. Gardeners in general have to wake up to the fact that in order to uplift the profession throughout the country they will have to affiliate with an association which is working for the uplift of the profession.

I believe that the gardeners, when advertising for positions, should advertise themselves as gardeners, not as laborers. In the local paper I saw an ad inserted by a man who wanted a position as gardener, or he would attend furnaces in the Winter. That is where the gardeners make a mistake. They are either gardeners or laborers; they cannot be both.

MR. MICHIE: Referring to Mr. Stewart's remarks with regard to a committee being appointed to endorse the applications, I believe we have a committee, and the same applies to these local branches. As Mr. Ebel's report states, we had a local branch organized this year and we have a Committee on Application. They have to get endorsement before they can become members. In that way we can be certain of getting the best men into the Association. We don't believe it is a wise policy to take everybody, and we want the National Association to stand for the best men of the profession, men who will not lower themselves and go down and use a pick and shovel and attend the furnace, wash windows, etc. We do not believe in receiving that class of men into the Association.

MR. STEWART: Along these lines, I think we have to use a little care. I can recall men who came to this country as laborers and became very much interested in plants, and the head gardeners are encouraging these men to go into the work by promising to promote them to positions in which they can

train themselves to be gardeners. That has worked out very satisfactorily in some instances.

The apprenticeship seems to have gone by the board. If we could get intelligent men and interest them in gardening and give them encouragement and help them along, in due time our Association ought to endorse such men by all means and encourage them, because I have personal knowledge of quite a few men who have obtained a high degree of efficiency in gardening by some head gardener giving them his encouragement and letting them have a chance.

PRESIDENT CRAIG: Are there any further remarks?

MR. WEEKS: I am glad the Secretary has seen fit to add a postscript to his ads with regard to the Service Bureau, stating that the National Association of Gardeners is not by any means a trade union organization. I am very glad that he has seen fit to do that because I believe that if there is any one thing the general employer abhors it is something that savors of trade unionism; and I think it would be well for us, upon all occasions, to emphasize this fact, that we are not a trade union; we are an organized body of professional men.

MR. McCULLOCH: There is one thing that I wish to bring before the convention, because I think this is the place to thrash it out. There is a little propaganda going around among the members of this Association who have been disappointed in obtaining positions. This propaganda is becoming a little rampant. I am told by one of the members from Southampton, who was here yesterday; and there are one or two in Oyster Bay from whom I have heard personally, who brought forth the claim that of those looking for a position, sometimes a few on the inside get the first choice. The Oyster Bay Horticultural Society stands solidly behind the National Association of Gardeners, but I wanted to bring the fact before the convention that there are some who belong to us as a body and as an Association, who are knocking the Association along those lines. I believe if anything of that kind is going on it ought to be known, brought up and discussed before this body.

MR. STEWART: I received several letters from members of our Association along these lines just spoken of by Mr. McCulloch, and I have been strongly urged to bring this matter up. I don't know much about it, but I know there is such a feeling abroad and light ought to be thrown upon the workings of the Association and the Service Bureau, and it ought to be given as much publicity as possible.

MR. GRAY: I think there is a good deal of reason for some of this talk going around because I, personally, know one party who wrote in about a position and never even received an answer from the office. There will be that sort of feeling on the part of the members if they don't get replies to their letters.

MR. WEEKS: May I ask whether this particular party was in good standing with the national organization? Many men who are not in good standing come along and ask the Association for assistance, especially in times such as these, when there are not very many jobs around. That is one thing which has to be taken into consideration. Don't allow any fellow to knock. Of course, we always find knockers. The thing to do is to sift right down to the bottom and find out whether that man was justified in knocking.

MR. GRAY: I believe that in order to bring the matter out fully, we ought to state specific cases.

SECRETARY EBEL: The matter concerning the Oyster Bay Society is not new. I had to go down there some years ago to get things straightened out. At that time it developed that one of the men who replied was not a member; he was not a gardener but a commercial man. I happened to make the statement that there was a Garden Club of Oyster Bay and he didn't know they had a Garden Club there.

There are a great many men who write to the office for positions, but their recommendations are such that we can't conscientiously give them positions so it places us in rather an awkward position. The recommendation which we get is treated confidentially, and we ask people when they answer to be very frank because their communication will be regarded as confidential. We endeavor to be as fair as we can to every man.

Mr. Stewart said there are men shifted from place to place. Do you know of any particular instance? If so, I might clear that up.

MR. HEAD: No doubt in all of our societies there is what we call a feeling such as has been described here. I have several times heard it said that a certain few were getting positions. I have had young men come back from the Association. I would ask, "Well, did you get anything?"

"No. There is no use going there. I can't get anything."

I said, "You can't expect to get a position if there are no positions to fill."

I have the pleasure of going to the Secretary's office every time I come to New York, which is quite often, from Red Bank. I wish to say positively there is not another office that I have seen that is conducted under a better principle, and under better

system, than the National Association of Gardeners. You must really appreciate that Mr. Ebel, our Secretary, is in position to know a good deal more than we realize. The letters are strictly confidential in regard to certain men's capabilities, character. You and I will never know about those things; no one will know but Mr. Ebel. Consequently, when a position is sent to the National Association of Gardeners to be filled, Mr. Ebel is responsible for the gardeners that he sends to that position. Some men will come in and because they have not been offered a position which they know somebody else has been sent to they think that they are not taken care of. Mr. Ebel is using his discretion and using his judgment. With the paper lying in front of him, he knows what he is doing. I maintain that Mr. Ebel is running this office up to date; as far as I know everything is strictly in order with what we want in that line. I think when you sift this whole thing down you will find that there is something behind these little technicalities which sound very large on the outside and yet do not amount to a great deal.

Regarding the improvement of the office as far as positions that are being filled is concerned, I think it would be interesting to know at this time how many positions have been filled. We know the dues were raised for the purpose of supporting the Bureau. I am a little bit surprised that Mr. Ebel didn't bring that up, but it was an oversight no doubt on his part. He has all the records there, and he could very soon give us that. This is one thing that will help us a little to know just what the Bureau does and has done, and I want to say right now the Bureau has done a great deal in a very short time. It takes a long while to get employers' confidence. It takes a long while to let them know that we are working and particularly that we are not a union; that we are not trying to put the wages up against the employers' ideas of what they ought to pay. It is a long journey, but Mr. Ebel worked hard along that line. You can see any time you go and talk it over with him that that is true.

MR. MACKINTOSH: My experience is very much like Mr. Head's. Every time I come to New York I run up to the office of the Secretary, and I don't think that during the last thirteen months I went into that office but what Mr. Ebel was busily engaged with someone. He advised me that he doesn't get time to attend to his paper or private business at all, but always in the morning he is engaged with somebody, talking the Association business over with them.

I wanted the thing talked over, because I thought Mr. Ebel knew more about it individually and collectively than I did, and I wanted to know if this sentiment I had heard of a few having the preference was correct. When a man joins an association, this or any other association especially for what he is going to get out of it and then applies for a job right away, do you think he is entitled to it? When a man falls in arrears, and then goes along until he finds he wants a job, and then pays up for that reason, do you think he is entitled to the first offer? Well, these are some of the things I have talked over with some of the men, and some of them have been in that position; have joined the Association when they never would have thought of joining it if they hadn't thought they were going to get something out of it. Then the paid members came into the office and because they do not get jobs, they will go out and knock. I don't care what an association secretary does, there is somebody who will be knocking all the time. I believe the National Association of Gardeners must be diplomatic. What you might recommend for one man might not be all right for another.

Now, another thing comes up with all these other things, and that is, how much do you respect this Association? How much do the gardeners in general respect it. What a little handful of people are here representing the gardeners around New York. You see enthusiastic men rightaway from the Middle West and the Far West. The gardeners of New Jersey are conspicuous by their absence. This is like a minister talking to an empty church, but I am going to do my duty. We should have a better meeting of gardeners. Is it an encouragement to the Association? Is it an encouragement to the Committee? The gardeners talk of raising the dues! My goodness alive, you spend enough for little things that would pay the dues to the Association two or three times over.

MR. KIEFER: I came from Saugerties this morning to be here with you. I first joined this Association to get a job; I came to get some knowledge rather than a job, however. I think if a man will prove himself before the gardeners he will get his own job. I think a man must come to this Association with the love of the profession in his heart, and the uplifting of the gardeners to get a position. That is my stand.

MR. MICHIE: If this Association cannot come here without these present grievances which take forever to straighten up, and if those fellows stay behind and get somebody else to do the talking for them, they will never get anywhere. It seems a pity that these fellows who are doing the knocking don't come here themselves and present their own case.

MR. CAMERON: There is nothing perfect in this world. If this Association were perfect, we would soon tire of it, just as we would get tired of and lose interest in a perfect garden.

I have been a member of this Association for a number of years and it has always been my contention that we get out of this organization just what we put into it. If the dues were ten or fifteen dollars, I would be quite willing to pay them. It seems to me that this is a most opportune time for us to get on the right basis. If this Association is worth anything, it certainly is worth five dollars a year to every single member, and he will probably get much more than that out of it.

Another thing, why is it that gardeners' advertisements appear in trade papers instead of in our own papers? It is a fact that very few advertisements are put in *THE GARDENERS' CHRONICLE*. In Boston for about six or seven years they were not supposed to sell to private gardeners, but still a good many of them have been doing it. I think it would indeed be a mistake if we did not discuss this entire situation and thrash everything out right here and now.

SECRETARY EBEL: Some of the New Jersey owners, those located in the vicinity of New York, have the benefit of drawing on New York to meet their demands for men, but a gardener in some other place might like to come down and they would not be willing to pay his expenses. I don't feel like sending word to a man and saying, "I have a position here, but I can't promise to take you when you get here and you will have to come at your own expense." How many would come, under those conditions? The New York owner says there ought to be enough men around without having the expense of getting gardeners to come from a distance. I have filled positions in Louisville and had the estate owner come on especially to interview gardeners. After he had interviewed them, he finally sent word to me that I ought to know what he wanted better than he did himself, in fact, I had to fill two positions that way. In the office, I have people calling me up on the 'phone all the time.

Now, the argument yesterday about the quarantine. That was all pre-arranged. I said when there was nothing doing somebody should get up an argument and that would start the racket going. There was a lady here who will report back to her society, which is a strong one, what she heard here, that the Association is for it rather than against. The gentlemen who started the argument simply got everybody confused in the hall.

Now, the success of the Association to some extent depends upon the Service Bureau. I am trying to find all the positions we can and to fill them with satisfaction. I only recall one up in Massachusetts, where a woman was dissatisfied with a man, but I understand she took a second man from another place. That is the only case that I know of where an estate owner was dissatisfied with a member of the Association. It may be that some of the other members know of some, but that is the only record we have.

PRESIDENT CRAIG: This man was recommended by this Association and I stood back of him. The employer was a very, very finicky lady. She took in another man to work in the nursery as an assistant in the orchid house. He petered out as I knew he would. They had taken in a man as head gardener who knew less than the man who had just left. They gave the man leaving the preference of staying as second man under the other man.

MR. MACKINTOSH: There is a matter that hasn't been brought up, and that is advertising. How much do you fellows do to help advertising? Was it Mr. Cameron who stated that in *The Florists' Exchange*, *The American Florist* and *The Florist's Review* there are columns of professional gardeners advertising for positions? *THE GARDENERS' CHRONICLE* is the Association's organ. You know the paper can only exist on the advertising matter. The paper for *THE GARDENERS' CHRONICLE* costs about all the money that paper brings in without any printing that is done, and that is what we pay for. It is the advertisements that pay for the paper.

MR. STEWART: In my mind the Service Bureau is getting to be a larger job than a one-man job. I am sure Mr. Ebel has done his very best in the years that have gone by, but I believe the time will come when he needs some real assistance instead of criticising him as we are today. We who are doing outside work ought to try to devise ways and means to give him assistance. It is true that the local societies have committees, but that does not debar our trying to find some other way of giving him assistance, having someone at Boston, Newport, Chicago, Cleveland, and so on, to give Mr. Ebel a little help that he may need in reference to the Service Bureau.

MR. GRAY: In Newport we have suggested how they should help out in this matter and I just want to give you the idea of having a committee to endorse the applicants. That might be of help to Mr. Ebel in the selection of men for positions. He can get the information about them from the location they come from. It would be a good way to keep poor men out of the organization and help Mr. Ebel wonderfully. I know he men-

tioned that he takes a record of the men from references which he gets from their employers. If Mr. Ebel could say these men had had the endorsement of some people up in their communities who are professional gardeners it would help.

MR. GRAY: Does not our Service Bureau take the place of advertising in *THE CHRONICLE*?

SECRETARY EBEL: I never like to take a man's money unless I feel I can give him returns. I don't think *THE CHRONICLE* would help in that way. If any member of the Association in search of a position, will simply advise the Bureau we will do what we can to help him, but I don't think to put an advertisement in *THE GARDENERS' CHRONICLE* for a position would get any result. Of course, that is talking against the interests of the paper.

MR. CAMERON: I think that is poor policy because there are many gardeners that are asked to fill positions. Sometimes they don't know of good men to put into positions, and if they saw the advertisements in *THE CHRONICLE* I think it might give those men a preference over others. I think that paper ought to take advertisements.

SECRETARY EBEL: If any of you gentlemen know of good positions, or know of good gardeners, refer them to the Service Bureau.

MR. CAMERON: What if the Service Bureau does not have anybody?

SECRETARY EBEL: If you are a member of the National Association of Gardeners, you will be co-operating with the Service Bureau. If you advertise in outside papers, the members would lose by it.

MR. CAMERON: I think we should help the paper along.

MR. COLLINS: I have heard a great deal of the National Association of Gardeners on the road and running the Service Bureau in particular. A great many men you run across, when you mention the National Association to them, will bring up the Service Bureau right away. They will tell you about some experience they have had. While there may be some reason for some of the criticism, we should try to devise the ways and means for the elimination of that criticism. That will be a great satisfaction to a great many of the members. I cannot offer any solution—I know of none—but I think there are men enough here to find ways and means for devising a better system than we have.

PRESIDENT CRAIG: All those in favor of accepting the Committee's report on the Service Bureau, signify by saying "Aye"; opposed, "No."

The motion to accept the Committee's report was carried.

PRESIDENT CRAIG: We have three other committee reports to come before us this morning. I wish to push this thing right along. Next is the report of the Committee on Interesting Young Men in the Gardening Profession.

Report of Committee on Training Young Men

At a meeting of the Committee on the Education of young Gardeners held at the Brooklyn Botanic Garden on Saturday, March 19th, the following outline of a course of instruction was drafted and is offered as a tentative scheme for the education of gardeners. Suggestions and criticisms are invited.

A. Entrance Requirements.

1. Age limit 18-25 years.
2. Not less than two years' practical experience in a garden or nursery, or other plant growing establishment approved by the National Association of Gardeners.
3. Personality to be acceptable to Secretary of N. A. G. and to school authorities.

B. Course of Study to occupy two years.

1. Actual practical work not less than four hours per diem.
2. Lecture and study periods not more than four hours per diem.

C. Courses of lectures as follows:—

1. *Plant Propagation*. Seeds, cuttings, division, layering, grafting, etc.
2. *Soils and Fertilizers*. Kinds and characteristics of soils. Use of organic and inorganic fertilizers.
3. *General Floriculture*. Cultivation of ornamental plants indoors and out. Principles of greenhouse management. Culture of annuals, biennials, perennials, roses, bulbs, tubers, etc. Floral decoration.
4. *Olericulture*. Cultivation of vegetables and salads out-doors and under glass.
5. *Pomology*. Cultivation of fruits out-doors and under glass. Pruning, etc.
6. *Dendrology*. Cultivation of trees and shrubs. Nursery practice, pruning, tree preservation.
7. *Principles of Landscape Gardening*.
8. *Plant Materials*. Flowering, trees, shrubs and other plants used in landscape design.

9. *Garden Foes and Friends*. Control of insects, diseases, etc. Economic Ornithology.
10. *Botany a. Physiology*—plant structure and function. *b. Taxonomy*—Classification and identification of plants.

It is recommended that the students be taken on frequent trips of inspection to plant growing establishments; floral, vegetable and fruit exhibitions, etc.

It is desirable that the work of students be arranged so that they may be responsible, at the discretion of the instructor, for certain greenhouses; and have opportunity of taking charge of work out-doors so that they may become familiar with handling men.

The course so far as possible should be given in a garden where practical application of the theoretical work may be made.

MONTAGUE FREE,
GEORGE H. PRING,
H. ERNEST DOWNER.

PRESIDENT CRAIG: You have heard the report of the Committee on Interesting Young Men in Gardening. Is there any discussion on the same?

SECRETARY EBEL: When we had our Convention at St. Louis, Director Moore of the Botanical Garden practically devoted a whole day to that subject. I had a meeting with Mr. Moore at the Gardens, and he offered a proposition which if the Association could carry on would be a wonderful thing. They have started a fully equipped building to train the young men.

His idea was if we could interest some wealthy man to make a contribution, we could put a trained, experienced man there to take hold and then take our young men and send them to an estate for a year or two. After that, let them come to St. Louis for a couple of years, and train them and then send them out. The Botanical Garden would call it the Institute of the National Association of Gardeners. I think it would be a wonderful thing. I have worked with a wealthy man in the hope of interesting him. I haven't given up hope. He is just completing a greenhouse and in it he is arranging and providing the facilities for taking care of young men, to give them a training. He is building a club house for them. He has a young man in his employ that was in the office the other day, and he told me what a fine employer that man was, that he was personally interested in seeing that everything was satisfactory.

If we could get a wealthy man to take up this proposition, it would certainly be a great opportunity for training young men, and I think this man I mention is sufficiently interested to do something.

MR. BAXTER: The United States Golf Association has the co-operation of quite a number of wealthy men. They are starting a course to educate their keepers and superintendents. The Golf Association is a new thing; it has only been in existence about two and a half or three years. There is a great future for the gardening profession. There will be all these golf courses to be kept; and many of them are doing landscape gardening, building greenhouses and so on.

Whenever I have a chance to talk with a gentleman who has a gardener I ask him what the gardener does. Then I mention the National Association, and tell him what we stand for. In fact, I talked to two or three gentlemen from Arlington and they did not know anything about the Association. They told me they were coming up here and they mentioned the Green Sox, National Golf Association. I thought that Association could co-operate in regard to young men taking up these studies and filling these positions. I told the gentlemen, "If you are looking for men qualified to run the grounds, you cannot do any better than to write a letter to our Secretary in New York." I gave them

the address, because many times gardeners might take up such positions.

SECRETARY EBEL: I had a call the other day from a man from somewhere outside of Chicago. He wanted a man that had had experience on a green, but I knew of no man who had had experience with that sort of thing. He was willing to pay \$250 a month to start.

MR. BARNET: Training young men in the state colleges offers a great opportunity. We had the good fortune to have Professor Wilde, of the Pennsylvania College, lecture to us on September 17. The Pennsylvania State College was not aware of the National Association of Gardeners. They had graduates, he said, one lady and two gentlemen, who had graduated some two years ago, and only one of them had an answer to an ad for a position as greenhouse assistant or gardener's assistant in any way shape or form. He did not apply to the right place.

They have conceived the idea that by getting the proper appropriations they could build some greenhouses and train young men and women to the gardening profession, or any course that they want to take up. Now, it seems to me that this is the kind of thing that we are looking for.

MR. PRING: Personally I think the training of gardeners is far better in a botanical garden of the type where they have facilities the same as you have in the universities, and where they can have the plant collections, which is essential for the training of gardeners. Now, the School of Gardening connected with the St. Louis Botanical Gardens is very good. Students have been turned out into positions prominent over the country, not only private estates, but landscape gardeners, florists, and men in business.

The requirements for the course are that the boy must have a high school education before he is admitted. Scholarships are open there. There are competitive examinations and the best man wins, of course. We don't require any previous experience in gardening. The student is required to take three years' training before we turn him out a qualified gardener. During that three years he is required to put every morning in on practical work in a manner so that he can say he has had practical experience in bedding plants, landscape work, floral display, commercial plants, and so on, and in addition to that the afternoon is given purely to theoretical training, that is, the study of plant diseases, and they are taking on a simplified course which is submitted tentatively to this organization.

MR. STEWART: The greatest fault that I have held about the college trained fellows is the question of work. I have no fault to find with their theoretical training. They are full of that, but when it comes to the question of back-bending and knuckling down to hard work, they are not there. The young men today don't seem to want to do the laborious work, and it is impossible for them to become thoroughly trained gardeners unless they know how to work, how to handle their hands. We put them to back-bending, make them do weeding, center their attention around hard work for a little while. It takes a good many years of hard knocking before they become good gardeners. The college ought to emphasize that point, that they should take some practical training under some competent gardener after they come out of the college.

MR. THOMSON: Many colleges put the course before the boys and they take that which they think they will like. It was not in the colleges for years, and then not as a full-time course. They had horticulture only a short time, only one or two hours, perhaps eight hours throughout the week. When they got through they were chockful of theory, but they didn't know how to do the practical work, and they don't want to get down to work.

SECRETARY EBEL: Mr. Barnet suggests that we co-operate with these colleges. We have done that to a great extent. We



National Association of Gardeners' Convention party in front of Park Avenue Hotel, New York City

frequently get letters from the instructors at the colleges asking if we have a place to put one of their young men in charge of. We seldom get any inquiries from them for assistant positions.

Mr. Downer, of University of Illinois, at Chicago convinced those who heard him that the training of gardeners in colleges was a good thing. Up to that time I was very much opposed to it. Today I even believe that a man ought to get a couple of years of practical experience first before entering college, get down to hard work, and then he will know what it is. Mr. Downer said at that time, "We sometimes give men diplomas not because we think they ought to have them, but because they get a certain per cent and we are compelled to give them."

He said if a man comes with a diploma from Illinois College, and says he is able to do that or this, and when you write to the instructor, the instructor may tell you that the boy would have done much better if he had turned to other work. Not many colleges are as frank as that.

I was up at Rockefeller's some years ago and a gardener was telling me he had some men from Cornell. When the men came, he put them to work on the manure pile and they said, "We didn't come here for that. We came here to direct. We are above that." They come from college and feel they are all ready to direct, but they have had no practical experience.

MR. BARNET: I agree with Mr. Ebel. My idea was in regard to emphasizing the fact that we should co-operate with the colleges. As President of the Pittsburgh Florist Club I have the responsibility of recommending to the college professors how they should go about this thing. It was done once in Massachusetts, and we were told that it was no business of ours. I want to go on record here as advocating this co-operation. It is not going to do either of us any harm.

MR. JUDSON: If we are going to interest young men to become interested in gardening, I think it is up to us to get hold of boys and put them on as apprentices. After they have served an apprenticeship, they might be interested in running private places. After he has gone through those hard knocks, and he will probably meet with plenty of them, he will then have a different attitude of life altogether. He will be of a different age then, and if he desires, he can take up theoretical training coupled with something more practical.

I think the college attitude, while it is right to a certain extent, is not right altogether. I don't think they ought to take a man until he is twenty-one, after he has completed three or four years of good, sound, hard, practical training from the wheelbarrow up.

It reverts back on the system. The system is wrong. We don't want these trained fellows trained through colleges. To a certain extent that is right, but if he does have the selection after he is twenty-one, he will then see the error of a good many things that he had to do from the beginning, see improved ways, and will find out for himself what a different mind he has when he is above twenty-one years of age.

I don't believe the botanical gardens would take him in before he is twenty-one. I had five years before of pretty good hard work. I saw those years helped me wonderfully. I came out with a good big swelled head, but after some years, I had a different attitude on life and the profession.

MR. McCULLOCH: There are one or two questions I would like to ask the Secretary, in regard to the work not being suitable for a college trained man who is tired of dirtying his hands. The young men of the present day don't wish to take a course in practical training on private estates. I have tried some of them and have started them into work like taking out weeds on the golf greens. As soon as I would turn my back they would throw their tools down. All they were interested in was growing the money. That is the case with most young men. They don't seem to want to take up the gardener's occupation at the present time. They are all looking for larger money and the college bred student is afraid of dirtying his hands. Where are we going to get the young men from?

MR. CAMERON: This has been quite interesting, but I think we cannot afford to close this session and let men go out feeling that college men are useless. I think a good deal of it depends upon the boy. It is the boy probably who has no interest in the business. Possibly the florist thinks his son should be a gardener, but the boy has no interest. If we get the right boys interested, I have no doubt they will be willing to work.

I don't think we ought to run down the college training. It is not altogether the fault of the colleges. The parents are at fault. They are causing the boys to think they are adapted to something higher. It is not the boys' fault. You have to go back to the parents. Seventy-five per cent, possibly twenty-five per cent, of these uninterested boys, is enough to overthrow the whole thing.

I think we ought to advise every boy who wants to become a gardener to get his theoretical experience, along with his practical experience. This Association cannot afford to throw down the colleges.

MR. PRING: I am very pleased to hear Mr. Cameron's remarks. It would be a big mistake for this Association to go on record as being against the college trained men. The time will come when the majority of positions will be filled by the trained man. I am not theoretically trained. I am in a position where I am brought in contact with the more practically trained men.

My boys—I have three—want to follow up the horticulture or floriculture profession and the various branches. The universities or colleges now lack the practical facilities, to a certain extent. They are trying to overcome this by building greenhouses, etc. They are trying to give the students floriculture. The farmers are talking about the boys being farmers trained at colleges. They laugh at the idea, but you will find just the same, when their sons grow up they want them to go to college, and they make, in the long run, the best farmers. They can get the most out of their land, larger crops, just because they know the systematic rotation of crops, and they know just what fertilizer will bring the vegetation out.

MR. GRAY: I have had a college graduate on my place this year, a boy working his way through college. It seems to me the sentiment among the gardeners is not against the college, but against the idea that gets into the young men's heads at college. This young man I mentioned says that the college gives the young man the distinction over the practical man, and he commands about three thousand a year when he comes out of that college over the practical man. That is probably what those young fellows are looking for, and when we ask them to learn the business under a practical man, they don't want to do it, and they won't do it.

MR. MACKINTOSH: I don't think any of us are knocking a college education. However, I advocate getting the practical side first. One of my boys got the practical side before he went to the university. After he graduated from the University he was elected to represent the State of Minnesota. I know the college education; I advocate it, and I think it is about the best thing a man can give his children, but you don't want to give them too much theory and not enough practice.

PRESIDENT CRAIG: I did not have the opportunity of going to college myself. I left school when I was fourteen. I think the botanical training as well as the college training is necessary for the man who in the future is going to preside over a fair-sized private estate.

I have three boys left, and I sent one to Amherst College a couple of weeks ago. I think he will eventually make good in private gardening or some branch of horticulture. There are four or five other boys going to that college this year, some of whom have had some training under me. They may not all become private gardeners, but the information they get there will be of vast importance to them in the future.

I think there is too much of this everlasting knocking of colleges by men who know very little of the training received there. I have asked men to go to Amherst to take a short course for a few weeks in the Winter, and they said in every case that they would be glad to do it. It broadens their minds and gives them things to think about that they had no idea of before. You can't expect a fully trained gardener from a college man who goes there only a short time.

If there is no further discussion, we will pass on to the next subject, report of the Committee on School Gardens.

... There was nothing from this Committee ...

The next is the Committee on Quarantine No. 37.

Report of the Committee on Quarantine 37

The work of Quarantine Committee No. 37 for the past year was rather awkward. Much of its efforts to secure modifications were "in the dark" so to speak, as it was compelled at the time to keep what it was doing secret. It met in the meeting composed of the different societies and called by the horticultural societies of New York, Massachusetts and Pennsylvania, to combine in securing modifications of the Bill.

Shortly after, the Committee was approached by a number of prominent estate owners to work with them, and the services of a prominent lawyer was secured, without expense to the association, who had a number of conferences with Dr. Marlatt, Chairman of the Federal Horticultural Board. For a while it appeared as though we were going to get some worth while modifications, but at the end nothing was accomplished. It was then decided to have a test case in court, but this was also later abandoned, owing to the opinion of several lawyers that nothing would be secured from it.

The Committee has done nothing recently, it is simply awaiting developments. There are plans on foot by other organizations to carry the work on to secure a modification of Quarantine Bill No. 37.

PRESIDENT CRAIG: Is there anything to be said on this question.

MR. BAXTER: I move the report be received, and passed on. I think we had enough discussion on it yesterday.

... The motion was seconded by Mr. Stewart and carried. . . .
PRESIDENT CRAIG: There is one more committee report, the report of the Committee on Signboards.

Report of the Committee on Signboards

Following the resolution passed at the St. Louis convention last year that the Association begin an active campaign to arouse public sentiment against the desecration of our highways by signboards, and which action received quite some publicity through papers in different parts of the country, there were many offers from individuals and other national organizations to co-operate in this work.

The Garden Club of America passed a resolution endorsing our stand, and agreed to co-operate with us, and also the American Association of Park Superintendents and the Farm Women's National Congress passed a resolution in favor of our action.

Circulars were distributed at the New York Flower Show, also at the Boston Show this Spring on the subject. The co-operation of one of the national poster advertising companies was offered to curtail the abuse of selecting the best sites along the highways for the erection of signboards.

While the question has been raised, "What good is this to the gardener?" and one society has voted its disapproval of the Gardeners' Association engaging in such work, certainly the gardeners ought to be as much interested as any wishing the natural landscape beauties of America conserved. The publicity that will come to the Association as the sponsor of this movement will be much.

Your committee expects to get an active campaign under way this Winter which will be productive of some practical results in what it is undertaking.

... It was voted, on motion of Mr. Baxter, seconded by Mr. Stewart, that the report of the Committee be accepted and filed. . . .

PRESIDENT CRAIG: Is there any new business to come before the Convention?

SECRETARY EBEL: Mr. Chairman, I have received a communication stating that the Government is classifying the gardeners as a servant. It was thought that the organization should do something to try to get the gardeners recognized as professional men. I thought it would be interesting to see how the Association feels on that as to what can be done. The classification of gardeners, I believe, came about when the war was on, on account of taxation, and they placed them under the same class as servants.

MR. BARNET: If you are rated as a gardener you get off much lower than if you are rated as a superintendent. However, I think gardener is the best name of the two.

MR. STEWART: You remember several years ago a foreign ambassador brought from abroad a coachman and gardener he had had in Europe. He was held up at New York on this contract labor business. He was stubborn enough to take it to the Supreme Court of the United States, and they classified the gardener as a domestic servant, and he was allowed to enter.

On Reforestation

PRESIDENT CRAIG: The subject of reforestation came up yesterday evening, after Mr. Davey had spoken, and I thought it might be well for the National Association of Gardeners to go on record as approving reforestation of private estates as far as possible, and a resolutions committee might be appointed to draw up a resolution to be presented at the afternoon session endorsing that. It is a good stand to take, I think. We need reforestation very much indeed. I think a resolution endorsing that might be well to present at the afternoon session.

... A motion was made, seconded and carried, that the President appoint a committee to draw up a resolution on reforestation. . . .

... President Craig appointed the following committee: Mr. Mackintosh, Mr. Cameron and Mr. Pring. . . .

On Preservation of Native Flora

PRESIDENT CRAIG: Another matter was discussed informally and that was the preservation of our beautiful native flowers. The Association ought to take some stand advocating not only the preservation as far as possible of the beautiful native flowers, but also the shrubs, trees, plants and bulbs.

MR. PRING: I believe it would be a good thing for the organization to go on record as approving that. I believe that a committee should be appointed to draw up a similar resolution to present to the meeting.

... President Craig appointed the following committee: Mr. Johnston, Mr. Weeks and Mr. Barnet. . . .

PRESIDENT CRAIG: The next thing for consideration is the selection of the next meeting place.

SECRETARY EBEL: I have invitations from all over the country, from Chambers of Commerce and Boards of Trade.

PRESIDENT CRAIG: That matter will be left in abeyance. . . . The meeting adjourned. . . .

WEDNESDAY AFTERNOON, OCTOBER 12, 1921.

The meeting convened with President Craig presiding.

Nominations of Officers

PRESIDENT CRAIG: The first business is the nomination of officers for the ensuing year. Nominations are now in order for officers.

... Robert Williamson nominated as President.

MR. WILLIAMSON: I think too much of the Association to allow my name to be nominated for President.

... James Stuart nominated but declined. . . .

PRESIDENT CRAIG: George H. Pring is nominated. Has that nomination been seconded?

MR. PRING: You have had a man from St. Louis quite recently fill the office of President. I believe you ought to appoint a man who is a little closer to the Secretary.

PRESIDENT CRAIG: Does that mean you decline?

MR. PRING: I would like to see some more Eastern men nominated.

... Wm. J. Sealey was nominated. . . .

... William J. Sealey declined nomination. . . .

GEORGE STEWART: I know of no man interested more in our profession and a man we can all rely upon for integrity and honesty than Robert Cameron, and I wish to nominate him.

... A motion was made, seconded and carried that nominations for President be closed. . . .

PRESIDENT CRAIG: Nominations for the office of Vice-President are now in order.

... John Barnet was nominated. . . .

... Motion made that nominations for Vice-President be closed, seconded and carried. . . .

PRESIDENT CRAIG: The next nominations in order will be for the office of Treasurer for the ensuing year.

MR. PRING: Gentlemen: In selecting a man as Treasurer you will have to be awfully careful, as we have been in the past. A man who handles money as we usually think of it, is a one-way man, that is he can get rid of it very quickly, if he only knows one phase of the game. I have in mind a man who is very capable to take care of money from the standpoint of increasing the amount that we have in the treasury by careful handling and who watches the expenses very, very closely. Now several of the nominees previously have jumped and declined, what for, I don't know. When a man is nominated, he should keep quiet. I have pleasure in nominating a man who is very close to the office of our Secretary, a man who can be called into consultation in a very few minutes either over the telephone or personally. I take pleasure in nominating Montague Free, of the Brooklyn Botanical Gardens.

... Nomination seconded and closed for office of Treasurer. . . .

PRESIDENT CRAIG: Nominations for the office of Secretary are now in order.

... Mr. Ebel was nominated. Nominations closed. . . .

PRESIDENT CRAIG: It is necessary to nominate five trustees for the ensuing year three from the State of New Jersey, and two from the outside.

... This statement was verified. . . .

Has anyone anything to say in regard to the next meeting place? Are there any suggestions as to where you want to meet next year?

MR. STEWART: Some are in favor of going to Boston next year.

PRESIDENT CRAIG: Is any other city suggested?

MR. CAMERON: This comes through Mr. Craig, and if you come to Boston, we will give you a good time and do our best to make your stay pleasant. We have a very fine arboretum there and we can show you a great many trees. It is a very old city, there are lots of historical places that would be very interesting to you. There are lots of people in the western and even eastern part of New York who have not seen these places, and if you will come to Boston you will be interested I am sure. There are a lot of old estates that are partly run down but there are also a lot of new ones worth seeing.

... A motion was made and carried that the next convention be held in Boston. . . .

PRESIDENT CRAIG: The Trustees elected to serve last October were as follows: William Waite, Arthur Smith and D. L. Mackintosh of New Jersey, L. P. Jensen and E. Strehle from Missouri.

SECRETARY EBEL: I would like to state that when we nominated those three men from New Jersey, the New Jersey charter provided for it.

J. STUART: I make a motion that Mr. Waite, Mr. Smith and Mr. Mackintosh be re-nominated.

... The motion was seconded and carried. . . .

A MEMBER: I would like to suggest the name of W. N. Craig.

. . . Motion seconded and carried. . . .

PRESIDENT CRAIG: You have heard the nominations, are there any further suggestions?

A MEMBER: I would like to suggest the name of H. E. Downer.

. . . A motion that nominations be closed was carried.

Is there any unfinished business to come up at this time?

Have the gentlemen drawn up resolutions regarding reforestation and preservation? Will they read their recommendations at this time?

Resolution on Reforestation as Follows:

We, the National Association of Gardeners, assembled in convention in the city of New York, recommend that immediate action on the part of the United States Government be taken upon the reforestation of the devastated area of this great country. We also suggest that the private estate owners should likewise support this plan of arboriculture: G. H. Pring, Robert Cameron, D. L. Mackintosh.

PRESIDENT CRAIG: You have heard this resolution, what are your wishes?

MR. GRAY: I should say that we drew up this resolution at our convention in New York City.

. . . The motion was seconded and carried at this time with the amendment of Mr. Gray. . . .

PRESIDENT CRAIG: The next in order is a resolution of the Committee of Preservation of Native Flora.

Resolution on Preservation of Native Flora as Follows:

Whereas, we, the National Association of Gardeners, assembled in convention in the city of New York, October 11 to 14, 1921, therefore be it

Resolved: That this Association go on record as opposed to the depredation and destruction of our native flora by tourists and others who oftentimes do this unwittingly: John Barnet, Robert Weeks and John F. Johnston.

. . . Motion made for the adoption of resolution as read and carried. . . .

Local Branches

PRESIDENT CRAIG: Mr. Gray asks about the formation of a branch of the National Association of Gardeners. This is the opportunity to bring that matter up. Has any member anything he wishes to say concerning this subject?

MR. WEEKS: Perhaps, the Secretary will kindly tell us how these branches were formed, how they work.

SECRETARY EBEL: These branches are organized by gardeners in different communities, nothing in our by-laws provides for them; they consist of a Chairman and a Secretary, and whenever anything comes up of interest they call a meeting. I believe in Newport they meet once a month. Nassau County had a meeting a couple of months ago and they appointed a Chairman, also a Clerk, and they decided to meet once a quarter unless something special comes up, then they will call a meeting, outside of the regular one.

MR. WEEKS: Do the branches of the National Association have to pay any dues other than the dues that are paid in the National Association? What plan of co-operation have they with the National Association?

SECRETARY EBEL: There is no plan of co-operation at present except if they want to submit anything to the Association at its convention, then we are supposed to act upon it. We had some resolutions at the St. Louis Convention, from Newport and some from Cleveland.

These resolutions did not come before the convention in the right form. These resolutions could not be acted upon because they were not published.

. . . A motion was made that a Committee be appointed to draw up rules and regulations for the formation of these branches. . . .

PRESIDENT CRAIG: At the last Convention a communication was read from Newport, one of the branches of the National Association. It is stated here in the discussion which followed the reading of this letter that the local branches would be of material aid to the progress of the Association and the proof of the interest could be secured among local people which is not now shown. The suggestion that that article be added to the by-laws could not be acted upon as the by-laws provide an amendment must be published ten days before the annual meeting. This was pointed out to Newport and other local branches that similar branches could be organized elsewhere without special provisions in the by-laws.

MR. STEWART: It seems to me that since our organization is a national one, there ought to be some locals in connection with the National Society. It is very hard to get the sentiment throughout the country unless we have local

branches, but as it is now so loosely constructed they think there is no affiliation, as you might say. We have no control over the Association and they have no control over us. There ought to be some way of binding up these local associations so that they would be responsible to some head somewhere.

MR. BARNET: Mr. Stewart is right. If local branches are affiliated they will have a chance to send delegates whose expenses will be paid. Then we will have the sentiments of the whole country, not local sections like New York, New Jersey, etc. It may have some important bearing on what we are discussing.

A MEMBER: I don't believe we are really gaining anything unless there is co-operation between the National Association of Gardeners and all the different gardeners existing at the present time. I firmly believe that co-operation as far as it goes is good but the trouble is that it is hard to get co-operation from the different societies. You members in different organizations know the feeling. If I criticize, I ought to bring a remedy, and I believe that if such a thing could be done it would be to get all the different societies to officially recognize the Association and have a certain space of time allotted to debating on the National Association of Gardeners and their affairs. At the present time the gardeners do not think that the Association's affairs are part of their fraternity.

MR. PRING: I would like to speak a few minutes with reference to what the St. Louis Association of Gardeners are doing. We have a membership of over one hundred members, and a membership, of course, for employers who usually come down when we discuss National Association business at our meetings. We are very enthusiastic about our Association, we have an average of between forty and fifty members present at general meetings once a month. We presume ourselves to be a branch of the National Association and discussed mediums, etc. before the local branch, when the next meeting was to take place, and the happenings of this convention, I then will have the pleasure of telling all the things that were brought up in this meeting. Now, we are a long way from the national headquarters and we find it is a little difficult to get the local men interested in the National Association, that was the main objection of a few men and we got the National Association meeting there in convention.

Now if you men in the East would get together a little more and form gardeners' associations in various communities or states you would find you would be one hundred per cent. better off and you would get more co-operation from the National Association. Then you could get the members together and thrash everything out and it could be brought before the directors of the meetings. I think that we should have sub-branches, as you might call it, of the National Association scattered throughout the country. This is not an Eastern organization but has spread out West as far as St. Louis and we are trying to spread it further West. If we can reach the Pacific Coast, so much the better. We look over the news that is given to THE CHRONICLE, we read with interest what Newport, Nassau, etc., are doing, but outside of that what do we hear of gardeners' associations in the East? In our local association we admit not only gardeners, but also men who are not gardeners but who are working for the profession trying to uplift it. We get them into the organization and every Winter we outline a certain course of addresses and lectures where we talk on various subjects relative to gardening.

MR. THOMSON: Would it not be possible to make a motion that a committee be appointed to take this matter up all over the country?

MR. BAXTER: We hold meetings all over the district and are invited to go to different places and when we get real hard up we go to the city greenhouses and we always find them open to us. I think the whole failure throughout the country is due to lack of co-operation.

MR. JOHNSON: We should have local branches all over the States so questions could be brought forward and full meetings held at which detailed discussions would take place. I don't know whether our standing is really illegal or otherwise.

MR. BAXTER: This Association is incorporated but you may find local branches of no standing, nevertheless the matter is brought up in the Association.

I don't see why branches could not be organized.

MR. STEWART: There is a very poor representation here at this Convention. Gardeners are in very peculiar positions. Unforeseen things arise, they cannot carry out plans as they want to. One man up in Massachusetts fully intended to be here but things in connection with his estate

arose so that he could not come. I have no doubt that similar conditions have prevented many others from attending this assembly. A gardener has to use a great deal of tact about things. Many of these gardeners who could not come here in person are, I am sure, with us in spirit, and are grieving over the fact that they could not be with us.

MR. McCULLOCH: We may have our plans all outlined and about an hour before we start work our employers come out and they wish to see us. I may state we have co-operation among gardeners in the East. Some, perhaps, may be a little delinquent. We have good men in the profession right here but we want to get down to a basis of working conditions for our organizations. I think the idea they have in the West of one dollar for dues is a good one to keep the small expenses moving.

SECRETARY EBEL: I want to ask Mr. McCulloch if he thinks a flower show would be a success with an attendance such as we have had the last two days. It seems that the gardeners can get out to the flower shows, but when it comes to the National Association of Gardeners they can't seem to get there. A gardener's duty is at his post and if we are not there when our employer wants us, they don't want us.

MR. MACKINTOSH: It is a fact recognized now among manufacturers and it has come to be almost law that people have to take their vacations. There are very few employers who do not realize that. If they are away a week or two, whichever it may happen to be, they come back with renewed vigor and energy making up more than the employer lost during their absence. I have always made it a point to attend conventions since I came to this country. I look upon that as my vacation. After all is said and done, I don't think that any gardener can spend his vacation in a more profitable way than to attend a convention, where he meets more friends, gets more information, and is brought into closer contact with the perplexing difficulties which this profession faces today.

PRESIDENT CRAIG: I quite agree with Mr. Mackintosh, but I must say that I am quite well satisfied with the attendance, but it could be improved.

MR. JOHNSON: Are we within our rights, having a local branch?

PRESIDENT CRAIG: I fail to see anything illegal in meeting together as a branch of this Association. I believe that is strictly a personal matter. Don't they have an association in the City of Boston?

MR. CAMERON: We have a big club of four hundred members. The Horticultural Society has numerous exhibit committee meetings. In New England we have the Boston Florists' Association. We don't think it is feasible to start branches and have too many irons in the fire. It may be a good thing in a smaller city where they have not so many organizations, but it hardly seems practical for us. Where we are trying to get these local associations organized throughout the country, however, there ought to be united effort and some assistance should be rendered to those people in the line of directing them as to how to organize and what to do. That is particularly true in places where there are no societies at present. In Westchester, Stamford and those kinds of places it might be difficult to start a branch of this organization because the gardeners can't always take the time to attend the meetings.

I believe, wherever possible, this is an opportune time to organize the various places. It seems to me that we should have certain instructions and by-laws governing organizations of these local societies.

MR. THOMSON: I would like to make a motion to have a committee appointed to draw up some kind of plans to be brought before the next meeting for full discussion.

The motion was seconded by Mr. Cameron.

MR. CAMERON: The question of having a branch in Boston is largely a matter of dues. The gardeners cannot afford to pay for meeting places. That is one reason why we don't have a branch. I firmly believe we have to have branches in our large cities. There is not a section of the country where we don't have gardeners, and we ought to have them organized and all stick together. We want to have an organization of our own. We want to decide all matters for ourselves. We certainly have our difficulties, and the only way to solve some of them is to thresh them out and discuss them. As I stated, I believe we should have branches of this organization in all of our large cities.

MR. JOHNSON: This whole question boils itself down to one thing: Are these local branches in sympathy with the purposes of the National Association of Gardeners? If they are, then the National Association ought to take some cognizance of them. I think it would be a very good thing if a committee were appointed in order to draw up some scheme

whereby the local branch will be linked up with the National Association. If they are no good, if they don't help the National Association, then what is the use of bothering with them?

It seems to me that the consensus of opinion is that the local branches are a great asset to the National Association of Gardeners, and I believe that they can do a great deal of good by reaching men in the localities which the National Association cannot reach, and bringing the men into the Association.

I take pleasure in supporting the motion made that a committee be appointed to formulate a scheme so that the local branch may be definitely connected with the National Society.

PRESIDENT CRAIG: A motion has been made that a committee be appointed to draw up suitable resolutions whereby the various branch organizations can be better affiliated with the National Society.

The question was put by the president and the motion was carried.

PRESIDENT CRAIG: Before taking up the next subject, however, it might be well to appoint the committee referred to in the last resolution, so that they may get together and take some action. I appoint John F. Johnson, James Stuart and our Secretary, Mr. Ebel, as the Committee, so they can get together fairly conveniently. I will also add John T. Everitt and George H. Pring, making five in all.

We will pass on to the next subject,

Examinations for and Classification of Gardeners

MR. BAXTER: That question was brought up in St. Louis last year; the year before it was brought up in Cleveland. It has been from pillar to post, and we finally knocked it out, and I don't believe it should be brought up at this convention. Why didn't those who were in favor of it show up and state their reasons? Quite a number from all over the country—Duluth, Davenport, Cedar Rapids, Chicago and so forth—gave it the proper knock on the head, and I don't see any reason for bringing it up again. There has been no definite plan; in fact, I never saw a working basis whereby it could be carried out. The organization has not money to finance it. Who is going to give the local examinations in different parts of the country? You can't do it here as they do in Europe. It is an entirely different proposition here; people are different, have different ideas, and you cannot carry out the same ideas that you can in Europe. I don't see why it should be brought up again.

SECRETARY EBEL: This subject was brought up at the time of the St. Louis meeting and we had a great deal of criticism from men in the East who thought we ought to have it in New York, as by far the largest majority of members reside here. There was rather a small representation in St. Louis, and it was felt that it ought to be brought up in a convention like the one we are holding here, where the representation would be greater. That was the reason it was brought up today, and I hope this will be the final discussion.

MR. GRAY: I think there was another plan passed at the St. Louis convention. It was proposed to have Mr. Ebel go through everybody's record.

MR. PRING: They suggested that all members of the National Association place their cards right in the hands of the Secretary of this Association, so he would know exactly every member's training, length of experience, etc. It seems to me that the Committee's report, presented this morning on the tentative plans for gardeners would cover it pretty well. We could overcome the questions arising. It has been before the conventions in Chicago, St. Louis and Cleveland, but I am here with you in New York now and am ready to discuss it if you are.

MR. MACKINTOSH: I think that Mr. Waite's letter of some time ago in THE CHRONICLE covers that fully. I think that before any one comes into this Association as a member, all their life history should be placed in the Secretary's hands so that the Secretary would be at all times able to look up the record and see what his qualifications are for a thing of that kind.

MR. PRING: It seems to me that that thing was discussed fully at St. Louis. Mr. Waite's letter, which appeared in THE GARDENERS' CHRONICLE expressed practically the various discussions brought forth at St. Louis.

I think that all members should place their cards on the table before they are admitted into this organization, as to personality, experience, etc. All this information should be filled out on an application form which should be filed with the Secretary and the Board of Directors, who are in close touch with him, should consult the files before that man is elected a member.

At the last meeting of the St. Louis Association of Gardeners they went on record as disapproving examinations. I

know very well that St. Louis would indorse an application idea stating the man's qualifications, experience, etc., sent through the Secretary before that man is admitted as a member of the Association.

MR. STEWART: There is danger in standardizing what gardeners should be. We had that system in our local branch and it became so overbearing in various ways that we had to do away with it. We could not in any way conduct any examination that would standardize a gardener. An average gardener would be at a great disadvantage. There are many men who have never had any early training, but who through the love of gardening have overcome tremendous disadvantages and proved themselves masters in the art of gardening in the end. It is a serious problem to say gardeners should be so and so.

MR. JOHNSON: Our by-laws adequately cover who should be members and who should not. I think as I read this, I may be wrong, but I don't believe we are open for discussion on examinations as to who will be members of this organization as some have been taught according to the notice here which says, "Examinations for and classification of gardeners."

I would like to make a motion in order to bring this thing to a head that this organization do not form any bureau for examination or classification of gardeners.

The motion was seconded and carried.

PRESIDENT CRAIG: What was your motion, Mr. Johnson? Will you repeat it?

MR. JOHNSON: I make a motion that this Association do not form any bureau, if you care to call it such, for the examination and classification of gardeners.

The motion was seconded and carried.

National Botanic Garden

MR. PRING: You all heard the report at the last Convention that this Society went on record as endorsing the movement in Washington through the channels of the Fine Arts Commission, of establishing a botanical garden there. It is unnecessary to elucidate what kind of gardens they are. Now I would like to bring this matter up to acquaint everybody with the fact and to push this project in the various organizations you are connected with, that is to support the movement on foot to make a real national botanical garden there for this great United States.

PRESIDENT CRAIG: I will appoint as a Committee on Final Resolutions to be presented at the short session tomorrow, Mr. Weeks, Mr. Cameron, Mr. Mackintosh. I think there should be a resolution about the national botanical garden. We ought to get behind that.

SECRETARY EBEL: I think we are behind that as much as we can be on the records at Washington. Our name is down among organizations which have endorsed it and I don't see where another endorsement is going to help; one endorsement is as good as half a dozen.

PRESIDENT CRAIG: If there is no further business, I suggest that we adjourn.

... Motion made, seconded and carried ...

... The meeting adjourned at 4:30 P. M. ...

THURSDAY MORNING, OCTOBER 13, 1921

The meeting convened with President Craig presiding.

... Mr. Craig read Mr. O. M. Eastman's paper on "Training Gardeners in the Public Schools," which appears next month.

Are there any remarks on the paper prepared by Mr. Eastman?

SECRETARY EBEL: This work is due to the convention which was held in Cleveland in 1920 when a committee was appointed which made recommendations that this work be undertaken. At that time they were spending \$800 a year, now they are spending \$40,000 for greenhouses. They were only able to put this appropriation through due to our convention. Cleveland people came to us asking our assistance, and we gave it to them.

MR. LOVELESS: I think it is a good thing to start this idea of getting the fundamental principles of gardening into the beings of the children so that they can gradually grow up into the practical work which is so necessary for all gardeners to know.

MR. ATKINS: I make a motion that we give a vote of thanks to Mr. Eastman for his paper and also a vote of thanks for the work which he is doing.

... A motion was made and carried ...

PRESIDENT CRAIG: Mr. Ebel has prepared some figures to give to you now.

... Mr. Ebel read figures regarding positions filled since the last convention as follows: 6 superintendents, 30 superintendents and gardeners, also position of foreman and assistants ...

PRESIDENT CRAIG: Since there has been no opposition to any of the nominations, it will be in order to instruct the secretary to cast one ballot for the entire set of officers for the ensuing year.

MR. GRAY: Seeing no opposition, I move that the Secretary cast one ballot for each nomination.

... The motion was made and seconded and stands carried ...

The Secretary has cast one ballot and I announce these officers as elected for the ensuing year:

President, Robert Cameron, Ipswich, Mass.

Vice-president, John Barnet, Sewickley, Pa.

Treasurer, Montague Free, Brooklyn, N. Y.

Secretary, M. C. Ebel, New York, N. Y.

Trustees: W. H. Waite, Rumson, N. J.; Arthur Smith, Long Branch, N. J.; D. L. Mackintosh, Alpine, N. J.; William Craig, Brookline, Mass.; H. E. Downer, Poughkeepsie, N. Y.

PRESIDENT CRAIG: We will now hear from the Committee on Final Resolutions.

Final Resolutions

MR. WEEKS: The Committee offers this resolution for adoption:

Resolved that the National Association of Gardeners now assembled in convention, extend a very hearty vote of thanks to all those ladies and gentlemen who have done so much to make this Annual Convention such a great success. First to the officers of the Association for the faithful and efficient discharge of their respective duties during their term of office throughout the Convention; second to the whole Convention Committee who have by their interest and unstinted efforts contributed to the success of the Convention and its enjoyment by all the members attending; to Jos. Manda for the orchids and other flowers furnished at the banquet. Robert Weeks, Robert Cameron, and D. L. Mackintosh.

I move the adoption of that resolution.

... The motion was made, seconded and carried ...

... A motion was entered for adjournment ...

Entertainment Features

On Tuesday evening an informal reception was tended at the Park Ave. Hotel, to the visiting gardeners, by the various local gardeners' societies in the vicinity of New York, at which music and refreshments were provided. Ex-Congressman M. L. Davey of Ohio, addressed the gathering on, "The Vital Relation of Trees and Human Life," which brought forth some interesting discussions and resulted in the association passing a resolution favoring national reforestation.

The visiting women attended the show at the Hippodrome and on returning to the hotel were served with supper.

Wednesday morning the women visitors enjoyed a sight-seeing trip around the city, inspecting some of the interesting buildings. After a luncheon, a visit was made to the Tower of the Cathedral of Commerce, sixty stories high, where a splendid bird's eye view of New York City and its surroundings was obtained.

The annual banquet took place in the Banquet Hall, Park Avenue Hotel, on Wednesday evening; Charles H. Totty presided as toastmaster, and called upon members from different parts of the country to respond to the various toasts assigned to them. Pleasant entertainment was furnished by Mrs. M. C. Ebel and by A. Mitchell, who rendered several solos. Dancing followed.

On Thursday morning the visitors to the convention left the hotel in automobiles at ten o'clock and motored to the country estate of Samuel Untermyer, Greystone, where they were entertained at luncheon. Mr. Untermyer came especially from his office to address the gardeners on the high calling of their profession and his love for nature, after which an inspection under the supervision of Albert Millard, superintendent, was made of the greenhouses and the grounds. From there the party proceeded to the nursery of F. R. Pierson, at Scarborough, and thence to the John D. Rockefeller estate at Pocantico Hills, where William Graham, gardener, led the party over the grounds and through the greenhouses. Leaving Pocantico Hills the party proceeded to the floral shop and greenhouses of F. R. Pierson at Tarrytown. The floral shop is regarded as one of the finest in the country. Here buffet supper was served by the office staff of Mr. Pierson's firm. Plans had been made for a dance, but it was so late that the visitors could not enjoy this part of the program. From there they returned to the hotel.

Friday morning the party left the hotel at nine o'clock in automobiles for a visit to some of the famous estates in Nassau County, Long Island, including the estates of Mrs. Henry Phipps, Nicholas F. Brady, Clarence H. Mackay, and the Lewis and Valentine nurseries, and from there to the Engineers' Country Club, Roslyn, where the party became the luncheon guests of W. R. Coe. After luncheon they proceeded to the W. R. Coe estate, Planting Fields, Oyster Bay, where Mr. Coe awaited them and personally conducted the party over his beautiful home grounds, assisted by A. E. Thatcher, superintendent.

Mrs. George D. Pratt's estate at Glen Cove was visited next, where John F. Johnston, superintendent, received the party and showed them over the place. The last place visited was Hempstead House, Port Washington, the estate of Daniel Guggenheim,

where Thomas Leyden, gardener, showed the party the gardens and greenhouses. This completed the day's trip, after which the party returned to the hotel. Credit is due for this day's enjoyable visit to the Long Island estates to Lewis and Valentine Company, under whose direction the trip was arranged.

IMPRESSIONS ON THE N. A. G. CONVENTION 1921

ROBERT CAMERON

UNDOUBTEDLY the Convention held in New York City on October 11, 12, 13, 14, was the most successful in the history of the association. The harmony and good feeling that prevailed throughout all the deliberations were indeed most satisfactory and made one feel that the members are taking things more seriously and that the success of the association is assured.

The officers and local convention committee certainly did their work well and unstinted praise is due them. The estates visited were a revelation to many and this feature of the convention is of immense value to the members. No two estates were alike and each one had its pleasing features. Gardening in Massachusetts is entirely different to what one sees around New York. Around New York many of the newer gardens are gaudy and conspicuously showy, whereas the older estates and gardens are more restful and pleasing. In many instances one would know who the landscape gardeners were without being told. The bright colored flowers and plants used in some of the gardens such as *Salvia splendens*, cannas, geraniums, bright-colored *Coleus* are seldom used in Massachusetts gardens. It was quite noticeable in most of the large new estates that the large formal gardens were laid out where they could be seen from the windows at all times. Where bright colors were used they must be indeed tire-some. In Massachusetts flower gardens are seldom near the house where they are under view continuously. They are more often at some distance from the house and secluded, and one often comes upon the garden unexpectedly. Then the gardens are seldom planted with plants with bright flowers as mentioned above but with more restful shades of blue, pink and white. Of the many gardens and estates visited during the convention the one most enjoyed by the writer, was one where hardly any flowers were used.

Greystone, Yonkers, the estate of Mr. Samuel Untermyer, was especially interesting. The range of greenhouses is quite large and the houses were all filled with well-grown plants. It was indeed a pleasure to see a fine collection of stove plants, they are

seen in so few places nowadays. Poinsettias and chrysanthemums were especially well grown. The large Greek garden is dignified; the planting is simple and restful. The red garden, blue garden, yellow garden, etc., were interesting but undoubtedly were past their best at the time of our visit. The different views of the Hudson River and the Palisades were fine and very much enjoyed.

Mr. John D. Rockefeller's estate at Pocantico Hills was just as expected it to be—dignified, peaceful, restful. Wouldn't one be disappointed if it was otherwise? What gave the place such a restful dignified feeling? The absence of flowers, the large specimen evergreens, the evergreen ground coverings which were conspicuous everywhere. Everything was well kept and well done.

On Long Island there were many estates visited and much more time could be spent on each estate.

The estate of Mrs. Henry Phipps (Bonnie Blink) was rather new. The plantings were nicely arranged and in a few years this will make a fine estate. The flower garden was conspicuous for its display of yellow zinnias.

The estate of Mr. Nicholas Brady is well kept and there is a good formal garden. The large bed of plants most enjoyed at this place was one containing a mass of fine blue-flowered *Ageratum*.

The fine estate of Mr. Clarence H. Mackey on Harbor Hill with its fine views was much enjoyed. The formal garden was conspicuously bright with plants and flowers.

One of the most interesting estates on Long Island is that of Mr. W. R. Coe at Oyster Bay. One could linger in this place for a week and then see new plants. Mr. Coe is a lover of plants and in this wonderful place there are specimens of the best and rarest plants from every part of the world. The flower garden was interesting and showed good and careful planting. The greenhouses were overflowing with well grown plants. The Camellia house with its many rare varieties was of special interest to gardeners.

The George D. Pratt estate with its fine evergreens, beautiful lawns and gardens were much admired and appreciated. This is another estate where one would like to linger for days and enjoy its dignity and repose.

It was rather late when we reached the estate of Mr. Daniel Guggenheim, but we had time to see the large formal garden which was well planted with plants to give continuous bloom throughout the season.

It would be ungrateful to close these notes without extending my warmest thanks to those who helped to make our outings so pleasant and profitable, Mr. Samuel Untermyer, Mr. F. R. Pierson, Lewis and Valentine Company, Mr. W. R. Coe and others.



Sunken Garden on W. R. Coe estate, Planting Fields, Oyster Bay, L. I.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD HORT. SOCIETY

The last monthly meeting of the above society was held in rather improvised quarters owing to the fact that we are having to vacate our old meeting place in Hubbard's Hall. However, we have been fortunate in securing The Red Men's Hall on Lewis street, Greenwich, in which our next meeting will be held. M. C. Ebel spoke to an attentive audience on the coming convention of the National Association of Gardeners in New York city. His real reason for being amongst us was to urge us to form a local branch of the National Association in the Westchester district, and after some discussion on the subject it was decided to call a meeting at White Plains soon after the convention. All members will receive a notice from Secretary Ebel in due course.

One member took the opportunity while Mr. Ebel was with us to ask numerous questions regarding how positions were filled and candidates chosen for positions by the secretary. In each case Mr. Ebel answered very satisfactorily and no doubt allayed many criticisms that have been directed against him in dealing with the employment bureau.

The Dahlia show held in Trinity Parish House, New Rochelle, Sept. 21-22, certainly was an apt reward for Mr. Troy and the committee whose untiring efforts made it possible for the citizens of that neighborhood to witness the largest and most unique show in the history of our society. The exhibits filled every inch of the Parish House and also a large tent erected on the grounds outside. Numerous collections staged by enthusiastic amateurs were a great feature. The public backed the affair from every angle and the throngs that attended testified that they were interested in our profession.

GEORGE HEWITT,
Cor. Secretary.

ST. LOUIS ASSN. OF GARDENERS

The St. Louis Association of Gardeners held their last outdoor meeting of the season on Oct. 2, 1921, at the Memorial Cemetery, near St. Louis. After a short business session at which President Geo. H. Pring was delegated to represent the association at the convention of the National Association of Gardeners in New York city, the members present were entertained by the superintendent of the cemetery, G. W. Saltee, who explained the problems to be solved at a cemetery in the making, this cemetery being yet in the formative stages.

The outdoor meetings of the past season have been unusually interesting and entertaining, and for this reason will probably be resumed next year.

S. T. JENSEN, Cor. Sec.

Here and There

HOW TO PROTECT THE LOCUST

Not only because of the beauty and fragrance of their blossoms (which also provide a valuable source of honey for the bee-keeper), but especially as a source of strong, long-enduring fence posts, are the members of the locust family to be classed among our really desirable trees. One factor alone has prevented their use in proportion to their usefulness, namely, their almost invariable

PLANT NAMES

AND THEIR MEANINGS is the title of a series of articles now appearing in The American Botanist where a multitude of other things of interest to the plant lover are also discussed. Quarterly, \$1.50 a year; specimen copy, 25 cents.

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infestation and early destruction by borers, for which no effective cure had until recently been discovered. For this reason the news, published by the Department of Agriculture, that a very simple method has been discovered for preventing the depredations of these insects, is welcome indeed.

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THE TREES

The trees have music of their own, a soft and soothing monotone, that lulls a man to rest; I have a volume to peruse, but, under them, I snore and snooze, my chin upon my breast. To sit beneath a swaying birch is much like being in a church; your drowsy

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eyelids close and to the realms of dreams you lie, until an active, loathsome fly camps down upon your nose. How often I have lain awake until I saw the morning break, and slumber would not come; and I would sadly leave the hay, to face another toilsome day, all punk and on the bum. My nights are often things of dread, but when I sit beneath a tree, the sweet restorer comes to me, its coattails in the air. The trees have voices sad and sweet, their world-old music they repeat, a solemn, sylvan choir; the same old song they used to sing when Earth was but a half-baked thing, and mortals worshipped fire. They croon their mournful lullaby while men are born, grow up and die, they sigh with every breeze; and when I quit this vale of tears I hope to sleep a million years beneath the nodding trees.—*The Canadian Countryman.*

WHY FLOWERS FADE

Prof. Hans Fitting of Bonn University lectured on the above subject some time since and *The Scientific American* for September contains an abbreviated translation of the paper as it appeared in a Berlin paper. The lecture was naturally scientific, but Prof. Fitting's experiments tend to prove that fading and dropping of flowers is largely hastened through injury or irritation to the stigma. The fact that fertilized flowers drop or wither more quickly than those not pollinated is, it is assumed, merely an illustration of the irritant effect on the stigma.

To keep flowers as long as possible we must prevent pollination and keep clear of all kinds of gas, even vitiated atmosphere, tobacco smoke and sudden heating. Strangely enough some orchids last longer after pollination.—*Florists' Exchange.*

THE POWER OF GROWTH

There is no human engineering which can compare in power with the silent machinery of a growing forest. It has been estimated that the physical energy of the sap in the plant is fourteen times that of the blood in man. Professor Clark, of the Massachusetts Agricultural College, has succeeded in measuring the power of the growth of a squash. He harnessed it in iron, put it in prison, and gave it a weight to lift. The squash, thus harnessed, was placed in a box in such a way that it could grow only by pushing upward, and lifting the long lever with the weights suspended on it. The result was that the squash steadily pushed its way upward, carrying the bar and weight with it. On August 21, it was lifting 60 pounds; September 15, it was lifting 1,400 pounds; October 18, it was lifting 3,120 pounds; and on October 31, it reached the 5,000 pound figure. How much more it could have carried is not known, for at this point the harness cut into the rind of the squash, thus putting an end to the experiment.—*Country Life.*

TREES AND SHRUBS WHICH ATTRACT BIRDS

In an article Prof. Alan F. Arnold, of the New York State College of Forestry, stated there was a possibility of many of our native birds disappearing altogether through lack of shelter and food to their liking. The writer then proceeded to give a list of advisable trees and shrubs to plant in the endeavor to supply the birds with the food they seek. Additionally, the professor drew attention to the fact that many of the plant-

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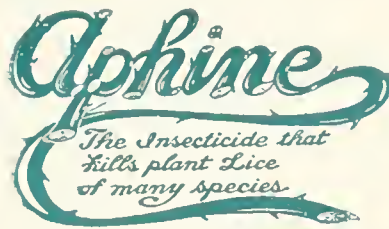
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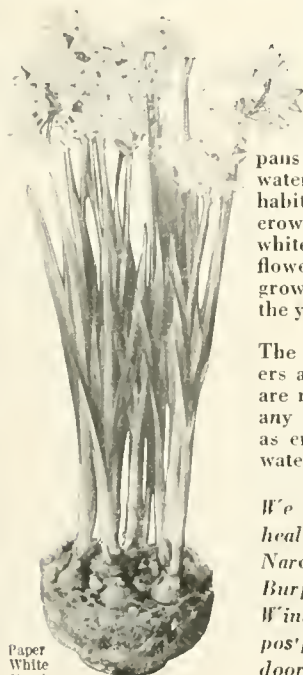
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GARDENERS' CHRONICLE

(OF AMERICA)

Devoted to the Science of Floriculture and Horticulture

Vol. XXV

NOVEMBER, 1921

No. 11

Things and Thoughts of the Garden

MONTAGUE FREE

BY using Birmingham as headquarters when on a horticultural pilgrimage one has the advantage of being able, at the expense of an hour or two's travel, to contrast the utter desolation of the "Black Country" so far as vegetation is concerned, with the rural beauty that surrounds the birthplace of Shakespeare. The "Black Country" is an industrial area, which takes in part of Warwickshire, Staffordshire, and Worcestershire—characterized in the daytime by a pall of sooty smoke which always hovers over it, and at night by the lurid glare from the blast furnaces.

As can be readily imagined, this district offers but little of interest to the gardener. The fumes, smoke, dust and refuse generally from the factories make it impossible to do any fine gardening. But the love for gardening is not non-existent, even in this factory area, for we noticed on our way to Birmingham, that at Hinckley, one of the stations on the line, there were extensive new plantations of roses, hybrid perpetuals and teas. These were planted in connection with a thrifty appearing hosiery factory.

The parks on the outskirts of Birmingham, which is on the border if not actually within the "Black Country" district, exhibit fairly good gardens of the usual park type, namely, an abundance of formal and carpet bedding. In Tower Grove Park, which is considered to be the best in Birmingham, a model of a crown, eight or ten feet high and as much in diameter, made up of various bedding plants, was evidently a feature of great interest.

When in this section, our first serious study of gardens was made in the village of Bourneville, possibly the premier garden city. This is the home of the famous Cadbury Chocolate Factory, and it is here that so much has been done to render tolerable the lives of the factory workers by the provision of suitable houses, each with ample garden space, and by laying out the village with due regard to landscape considerations—the exact opposite of what one usually encounters in a factory town. This enlightened and progressive firm provides a recreation area for its girl workers, consisting of a garden covering about thirteen acres, that has all the appurtenances one finds on a well kept private estate. This area was formerly a country estate and, in adapting it for the needs of the girl workers, very few radical changes have been made. The number of tennis courts has been greatly augmented and an outdoor theatre constructed, but apart from this and the fact that provision for its upkeep is made in a manner that is seldom seen on private estates in England at the present time, there is little to distin-

guish it from a private garden. The old, walled, kitchen garden, which occupies about four acres, has in part been changed over to a flower garden, although many of the old fruit trees, both in the open and on the walls, have been left standing. This garden contains well laid out herbaceous borders, and the less prominent parts of it are devoted to the production of cut flowers which are used in the decoration of the various dining rooms. Here we saw sweet peas with all the laterals pinched out, grown to a single stem, each tied to an individual stake, towering up in the air, and comparable to anything rather than sweet peas. One cannot help feeling that sweet peas were never meant to be treated in this way, even though it may be possible by this means to get extra long and stout flowering stems.

In this part of the garden are located the greenhouses, which are used for growing decorative material, mainly flowering plants for use in reception halls, dining rooms, and rest rooms in the factory. Later on, when making an inspection of the factory we saw some of this material in the shape of tuberous Begonias, which were of superb excellence, and fit to grace the tables of any floral exhibition.

In England no garden seems to be complete unless it has provision made for the growth of alpine and rock plants, and this garden was no exception. Here a steep slope is utilized, faced with rocks and planted with alpine and other rock plants, forming a pleasant adjunct to the general ensemble. Near by is a formal lily pool, which occupies the site of the former mansion. In this pool is a large collection of hardy water lilies.

Passing from the pool, we come to the open air stage with its amphitheatre of closely mown turf. The stage is approached by steps in the classic style, and is surrounded by a pergola clothed with vines. This whole area is encircled with gracefully overarched trees, and altogether forms an ideal setting for pastoral and other plays, which are produced by the employees of the factory.

The gymnasium, which is also used as a lunch room, presents a blaze of color to the observer coming in from the garden, for its veranda is beautified by the use of enormous hanging baskets, furnished with such plants as fuchsia and ivy-leaved geranium. The pillars of the veranda and other vantage points are utilized to support various flowering vines, and one of these, Clematis King Edward VII, was making a wonderful display at the time of our visit. The garden is open for the use of girl employees from 7 a. m. to 9 p. m., of course exclusive

of their working hours, and that it is appreciated is apparent from the extent it is used and from the fact that there is no vandalism.

It is refreshing and encouraging to realize that a great firm such as this realizes the importance of beautiful surroundings in the lives of human beings. That the beneficial influence of a garden is fully recognized, is to be deduced from the fact that this garden is kept to the top notch of perfection with the assistance of a competent staff of trained gardeners, headed by a graduate of the Royal Gardens, Kew.

Our next move was an expedition into the Shakespearean country, and, in true American fashion, a start was made from Birmingham rather late in the morning, with the idea of taking in all that Warwick, Stratford-on-Avon and Kenilworth had to offer in the way of horticultural interest. We did not do all that we set out to do by any means, but to compensate somewhat for this, we were enabled to take in one or two gardens of which we had no previous knowledge.

On finding that a wait of one hour or so was necessary at Coventry, in order to make rail connection for Warwick, a hurried expedition was made into the town to see what it contained in the way of gardens. Possibly our visit was somewhat too hurried, for Coventry proved to be rather barren of interest horticulturally, except for some wonderful specimens of holly trees which were seen in abundance on the grounds of villa residences near the station. However, fine holly trees in England are by no means rarities!

Warwick Castle and its environs furnishes much of interest to the gardener. The approach to the castle is made through a picturesque winding driveway for part of the distance cut through solid rock, sometimes to a depth of fifteen to twenty feet. This was constructed by George, the second Earl of Warwick, about one hundred and twenty or more years ago. This driveway is now of great beauty, overhung as it is with ancient trees, its walls mantled with moss, and its crevices filled with ferns and other plants.

Upon emerging into the open, one is impressed with the immense plantings of rhododendrons. Amongst these, at the time of our visit, were many patches of flaming scarlet, caused by the blossoming of *Tropaeolum speciosum*. This interesting perennial nasturtium is a native of Chile, and resents anything approaching hot conditions at the root. Its cultural needs are very similar to those of some of the hardy lilies, and it will only succeed when planted amongst shrubs. In England it is frequently planted among yew hedges, and the garden books usually recommend such a situation for it, but the vigor and beauty of the plants at Warwick are sufficient evidence that it will thrive equally well, if not better, amongst rhododendrons.

In addition to the rhododendron plantings around the grounds, the deep, dry moat that encircles the castle has its banks entirely clothed with the commoner varieties. These must be a wonderful sight in Spring, when in full bloom.

The formal gardens, which were laid out by Capability Brown occupy an area in front of a structure which was built for the purpose of housing the gigantic "Warwick Vase," two thousand three hundred years old, one of the finest remains of Grecian art. This was recovered from a small lake near Rome in 1770, and bought by George, the second Earl of Warwick. This Bacchanalian vase is carved from a solid block of white marble and holds one hundred and sixty-three gallons. It is supposed by many to have been designed as a container for wine and used on festive occasions in ancient times.

The building in which it is housed was formerly used as an orangery, but it is now filled with palms and other conservatory plants, which provide a beautiful setting for the gigantic vase. There are advantages in being a gardener after all, for, upon introducing ourselves to Mr. Smail, the head gardener, we were conducted, as a preliminary to a tour around the grounds, to the conservatory and accorded a close view of this wonderful work of art, a privilege that is denied the casual visitor, who has to get the best view he can through the glass door of the conservatory.

Incidentally, there is a fine specimen of wistaria growing over this building, and its ancient appearance causes one to surmise that it must have been planted at the time when the conservatory was built, one hundred and twenty years or more ago.

One could wish that the gardens surrounding the castle were kept up in a manner more befitting the importance of the estate and the beauty of the architectural environment. The formal garden, although well designed, loses a great deal of its effectiveness because of the mediocrity of the bedding. The beds here are bordered with well kept dwarf, and clipped hedges of box and yew, with larger specimens, sheared to simulate the outlines of birds, etc., placed at certain principal and strategic points. But it was disturbing, to say the least, to see some examples of topiary work nearby in process of being overgrown by adjacent shrubbery.

Like all English gardens, Warwick Castle has its Rock Garden, but in this case there is nothing to brag about. It is overhung by large trees, and in such a position, it is of course impossible to grow a large selection of rock plants.

Most of the greenhouses are located in the kitchen garden and are used mainly in the cultivation of fruits such as grapes, peaches, and figs. The kitchen garden itself is of course walled, and the walls are furnished with splendid fruit trees.

The great glory of the castle grounds, however, is to be seen not in the more formal plantings, but in the wonderful specimen trees, with which the grounds immediately surrounding the castle are replete. Many of these were planted about one hundred and twenty years ago by George, second Earl of Warwick, the same nobleman who was responsible for the construction of the entrance driveway, the conservatory, and the ornamental lake. The guide-book states that he planted trees to the value of nearly 100,000 pounds, which was quite a considerable amount of money in those days. There are still many wonderful specimens of the Cedar of Lebanon (which probably date back to the time of the second Earl), in spite of the havoc wrought amongst them by a great gale in 1895, which completely destroyed two of the best of them. Quite a number were badly injured by a belated fall of snow ten or eleven years ago, which settled on their horizontal branches and, by its sheer weight, caused them to break down. The oak, beeches, and Spanish chestnuts are very fine, and one would have to travel far to find specimens such as can be seen on either hand, when traversing the grounds of Warwick Castle.

Here, too, are to be seen great specimen yew trees, a source of surprise to those accustomed to seeing the small specimens that are commonly met with in this country, which, after all, can only be considered as bushes. The yews at Warwick, many of them, have trunks which must be eighteen inches or more in diameter, and which ascend in the same manner as a regular tree. One can only guess at the age of these yews, which must be that of Methuselah!

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Providing the Plants With Winter Overcoats

FLORUM AMATOR

IN November or December many herbaceous perennial plants and some bushes, shrubs and trees should be provided with Winter overcoats. In the case of some this must be done to keep, so to speak, the breath of life in them till Spring returns. Others might be able to come through the Winter without top coats, but are in better health when the swallows come again, if they have this extra clothing. There are still others which though devoid even of leaves, defy old Hiem's freezing breath, and Boreas' chilling blasts, and when Spring returns are as rugged as ever.

There are then two factors which determine whether we will give our plants heavy or light weight Winter overcoats, or none at all, namely the character of the plant, whether hardy or tender and the latitude in which it is growing. If a plant needs Winter protection at all, as a matter of course, it will need a certain amount, for example, in the latitude of New York; less as we go farther south, say below Washington, D. C., and more in a latitude north of New York, except in those sections farther north where the ground soon after it freezes hard is covered by the snow, and remains snow covered till Spring returns. In such sections, plants need no more protection, indeed perhaps not as much, as in those latitudes where the Winters are characterized by the alternate freezing and thawing of the ground.

BUSHES, SHRUBS AND TREES

Rose Bushes

Tea-scented and Hybrid Tea rose bushes in latitudes where the Winter temperature ranges from 20 degrees above down to below zero need protection, and the Hybrid Perpetuals, Climbers, Ramblers, and other classes of roses are benefited by such care. The old method of protecting rose bushes in the Winter was to nearly or quite cover the Teas and Hybrid Teas with coarse, strawy manure or leaves or meadow hay, and to pile up such material high around the Hybrid Perpetuals and others and to bind a sheaf of straw around that part of the bush above the manure or hay. While these coverings made a protection for the bushes, they also provided Winter houses for the field mice, which in Winter when other food was scarce would nibble off the bark from the rose bushes for food, and in so doing girdle the bushes close to the ground and greatly injure or kill them. The newer, and far better way of protecting rose bushes is as follows: Set strong stakes about as tall as the bushes firmly in the ground close to the body of the bushes in late Autumn; prune the bushes just enough to take away their ragged appearance; tie a soft string on each stake about opposite the middle of the rose bush, and pass it around the bush and draw this together and up against the stake; in case of the Hybrid Perpetuals two or three ties may be necessary. After the ground is crusted by the frost to a depth of about two inches, heap rich soil up around each bush to the depth of eight to twelve inches. This is all the protection necessary, though in very cold sections after the heap of soil around the bush is frozen hard, coarse manure and leaves, or similar material may be placed above the heap of soil and the taller Hybrid Perpetuals may be given a sheaf of straw around them above the soil. If the rose bushes are so close together that taking the soil from near them to bank them up will expose any of their lateral roots, as might be the case when bushes

are set in a bed, the soil for placing around them must be brought from elsewhere.

Shrubs

Shrubs, especially the more tender kinds, may be protected in Winter in much the same way as rose bushes, namely, tied to strong stakes which will prevent heavy snows from breaking down either rose bushes or shrubs, heaped up round about with rich soil, and this when necessary covered with manure or leaves after the soil has frozen. We may say here that manure or other material placed above the heap of frozen soil is not so liable to harbor field mice as when these materials alone are freely used around bushes or shrubs, and that the heap of frozen soil acts as a defense to keep the mice from girdling the bushes or shrubs. Rich soil, alone, however, is preferable, unless extremely low temperatures make the addition of leaves absolutely necessary.

Trees

Young trees of all kinds, and the more tender kinds of other trees should be protected in much the same way as shrubs. The staking and tying, and the soil heaped up around them helps the trees as well as the shrubs and taller rose bushes to meet the buffeting of the Winter winds.

HERBACEOUS PLANTS

The Winter overcoats suitable for herbaceous plants are coarse strawy manure, marsh hay, straw, leaves, branches of evergreen trees, rather than the rich soil which we use for protecting bushes, shrubs and trees; not but what the rich soil would protect herbaceous plants but because it would make too heavy a covering and have a tendency to smother, especially the smaller herbaceous evergreen plants and would be difficult of removal in Spring without injury to the tender sprouts of the plants which would be then appearing above ground.

Herbaceous plants may be divided into two general classes, the deciduous, comprising those plants whose tops die right down to the ground in late Autumn, for example Peonies, Phlox, Gaillardia, Lily of the Valley, and most of the Lilies, and other bulbous plants; the evergreen, comprising those plants whose foliage, remains more or less green all Winter, for example, Oriental Poppies, *Lilium Candidum*, and *Digitalis*. The dead tops of the deciduous plants should be cut off close down to the ground and thrown back over the plants to form at the same time a partial protection and a support, as it were, to keep the six to eight inches of coarse manure or other material, which is used as a Winter protection for the plants, from bearing down too closely and heavily on them.

In the case of the evergreen herbaceous plants the same material used for a covering for deciduous plants should be placed to the depth of several inches around and close to them, but not on them. Six or eight inches have been given as about the proper depth for a cover, but these figures are not arbitrary; observation and experience will teach how thick a covering each of the several kinds of plants need. In the case of evergreen herbaceous plants whose foliage hugs the ground, it is advisable to place over these, small branches of evergreen trees or

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Veronica-Speedwell

RICHARD ROTHE

OF the one hundred known species of the genus *Veronica*, a member of the order *Scrophularinae*, hardly more than a dozen merit a deeper interest on the part of horticulturists and garden owners. The low-growing or creeping alpine speedwells, enhancing the beauty of the Spring florescence of rock gardens and conspicuous by their characteristic sheets of bright blue, lavender, or white blossoms endure our hottest and driest Summers and as a rule survive our Winters without injury. This applies first of all to our favorite, *Veronica rupestris*, a charming mountain denizen arrayed in clouds of little bright amethyst blue flower spikes, literally covering the foliage during June. The speedwell of Scotland, *Veronica saxatilis*, as well as the bright blue and pale lavender blossoms of *Veronica prostrata*, a species inhabiting the mountainous regions of Germany, when in full bloom in our rockeries speak to us in enchanting sentences of glorious Spring days amid high sunny slopes. Very attractive is the silvery white foliage of *Veronica incana* of southwestern Europe and northern Asia while the vivid blue of slender spikes late in May and early in June add to its beauty. The best white species for rockeries is *Veronica repens*, hailing from the Island of Corsica, a very low creeping variety with dark green densely set foliage. This species adapts itself very well as ground

many American gardens. The genuine species *Veronica longifolia*, hailing from Eastern Europe and the northern part of Asia, produces flowers of lilac purple shades;



Veronica incana.



Veronica virginiana alba.

covering between stepping stones and for roughly set stone plate walks in formal gardens.

Desirous of full displays of blossoms in vivid colors we have to take up and divide plants every other year, re-setting them in freshly manured soil. The ornamental merit of the taller growing species is well known. Our native speedwell, *Veronica virginiana*, distinguishable by its whorled foliage is more adapted for the wild flower garden. Preferable for stately and graceful effects is its white flowering form, *virginiana alba*, depicted by our illustration. *Veronica spicata*, a native of Central Europe, medium tall, producing slender sky-blue flower spikes, is one of our hardiest standard border plants. The most popular speedwell, however, is *Veronica longifolia subsessilis*, syn. *V. Hendersoni*, a native of Japan. Its long deep blue spikes during August and September are a conspicuous feature in the mid-Summer color arrays of

longifolia alba blooms white and *longifolia rosea*, pink. Concluding I mention the species *Veronica amethystina* and *V. gentianoides* as being of interest for botanists and plant collectors.

Veronicas are raised from seed or propagated by cuttings and divisions. As a rule they prefer a rather light and well-drained soil in open sunny situations. The alpine class calls for light Winter protection, while the taller growing species, with perhaps the exception of *Veronica longifolia subsessilis*, within the Middle Atlantic States do not require special coverings.

PROVIDING THE PLANTS WITH WINTER OVERCOATS

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twigs of deciduous trees or dry stalks of any garden plants to keep the manure or other covering from resting too closely upon them and causing them to rot away. In fact, even in the case of some deciduous herbaceous plants, the Peony, for example, there is danger if the crowns are covered too heavily with manure, that these will not rot away.

How about the field mice housing in these materials which form the Winter overcoats of herbaceous plants? Very likely the mice will make their Winter abode in these coverings, but they do not as a rule make either the roots or tops of herbaceous plants their food, except Tulips and Lilies, and a few other bulbs which should never be covered till the ground is frozen two or three inches deep, so that the mice cannot easily dig down to the bulbs when wintering under the covering. Indeed it is better in the case of nearly all bushes, shrubs, trees and herbaceous plants, that the ground should be frozen to the depth of two or three inches, before they are provided with their Winter overcoats and it should be always kept in mind that these overcoats are just as beneficial in keeping the soil and the plants from alternate freezings and thawings, as in keeping the soil and the plants from freezing any deeper and harder after they are put on the plants.

The Royal Chrysanthemum

BERTHA BERBERT-HAMMOND

*Fair flowers of Autumn, though to you
Sweet fragrance is denied,
Your beauty amply compensates
The lack; from side to side
Your graceful forms sway in the breeze,
When all the leaves are off the trees.*

Bertha Muhleman.

THOUGH the chrysanthemum is practically scentless, its great beauty and varieties of form and coloring, and its late habit of bloom, have won for it the fitting title of "Queen of Autumn."

During the past decade, the chrysanthemum has made in this country rapid strides into popular favor, and the interest in this flower of merit is constantly increasing, due in a great measure to the educating influence of the wonderful displays staged at both local and at national chrysanthemum shows. In the city of Washington, at one of the recent governmental shows, it is said that nearly three hundred fine varieties were exhibited.

To view the large blooms, produced by systematic budding in the form of downy plumes, loosely formed Japanese, and brightly colored Chinese varieties, one would hardly suspect that these regal flowers are the descendants of a sort of wild daisy that was cultivated and hybridized many centuries ago by Chinese botanists, and later introduced into Japan, where it was still further developed until the flower became closely associated with the interests of the country. The Japanese of today are enthusiastic chrysanthemum growers and show their love and appreciation of the flower by using the word Kiku (chrysanthemum) as the name of the ninth month of their calendar in which they hold a chrysanthemum carnival. Kiku is also a favorite name for Japanese girls. In art the chrysanthemum plays an important part, as the Japanese use this flower freely in their decorations, evidences of which may be found on the fans, screens, boxes, china, etc., that we import. A high honor in Japan that is conferred on royalty only is that of "The Imperial Order of the Chrysanthemum," proving that in Japan this flower is held in high esteem. On the other hand, in some parts of Italy it does not enjoy such popularity. Because of its use as a cemetery plant it has, unfortunately, become associated in the minds of many people with sorrow and death.

Besides, Japan, England, Australia and the United States grow the chrysanthemum extensively, producing flowers of a high standard of merit. To raise such rare beauties as are shown at noteworthy exhibitions requires considerable experience, skill, time and great care. The grower must know how and when to repot, feed, water, protect, prune and disbud the plants, for usually only one bud is left, all the others being sacrificed that the strength of the severely pruned plant may be concentrated into the full development of this one bud. With all hopes centered on one bud to a plant, unremitting patience and care are required to guard against injury from pests, blight, mildew, changes of temperature, or accidents, and the reward for this patient, intelligent cultural treatment is the perfect blossoms of great size, quality and rare beauty so universally admired.

Though the average amateur may not be able to produce prize-winning blooms, he can, with a little extra trouble and close attention, grow some really creditable chrysanthemums by procuring in the Spring well-rooted cuttings of the desired sorts. If these plants are to be grown by the pot method, they will require shifting from time to time into larger pots, and pruning of the lateral shoots as they present themselves. About August the plants may be watered with liquid fertilizer until the buds appear. The crown bud should be removed at once, and all but a few of the others should be rubbed off, so as to allow the full strength of the plant for the development of the selected buds. Before frost, these potted plants should be removed to a sheltered porch or frost-proof room.

If in May, when the small chrysanthemum cuttings are received from the florist, they are set out in a sunny bed in well-worked enriched soil, much of the time and labor necessary in the potting system may be saved. Placing the plants a little over a foot apart in well defined rows adds to the convenience and lessens the care required to water, feed, prune and protect them from the harmful effects of burning rays of sunshine or from early frosts. Staking the plants will guard against damage from heavy rain or wind storms.

While the large-flowered, less hardy varieties require Winter protection, the dainty little pompons are quite hardy and will continue a display of bloom, adding interest and color to the garden after the other flowers have been frost-killed.

The Topiary Art

IT is not without interest, from time to time, to cast an eye back upon what were the men and the things of another period. Comparison of customs and tasks permits the accounting for the changes that have operated and for the difference, at times profound, that separates us from the times that are passed. Such an opportunity was furnished us, in what concerns the art of gardening, in the course of a visit that we made in 1912 to Friar Park, the splendid estate of Sir Frank Crisp at Henley-on-Thames in the suburbs of Greater London.

It would require pages to describe the importance and the great beauty of the park, and to speak of the lengthy

galleries and underground grottoes lighted by electricity, and of which certain scenes are so strange and impressive that they make one think of the "Thousand and One Nights." A large fortune has certainly been expended for the construction of these grottoes, which extend over several hundreds of meters, opening upon a large lake. *Le Petit Jardin* has already given the description of some of the most beautiful views of Mr. Crisp's gigantic Alpine garden.

It is a well-known fact that the topiary art, which flourished in the sixteenth century and persisted to the end of the eighteenth, consisted in trimming trees, that lent themselves to it, into forms geometrical or fantastic.

While in France, at the time of Le Notre (1613-1700), deciduous trees, principally the hornbeam, were employed to make the screens and arbors symmetrically pruned, abroad, especially in England, trees of persistent leaves, the yew above all, were made to contribute to this same use and to the formation of the most diverse objects.

There have remained in our country, upon the great estates of our period, notably at Versailles, at Trianon, at Chantilly, works of the celebrated architecture cited, hedges of hornbeam, sufficiently well preserved, and of yews trimmed in pyramidal form, that make a good effect in the neighborhood of the great fountains at Versailles. There are seen, also, on certain estates like that of Messrs. Moser at Versailles, yews trimmed even more fantastic, but nowhere in our country, to our knowledge at least, does there exist a scene entirely formed of these trained trees, comparable to those of some English parks, made famous by this art.

It is the case of Elvaston Castle in Derbyshire, of which the walls, the bastions, the towers, etc., are formed by conical hedges of yews, whether of the ordinary type or of the pretty golden variety, which takes on a very yellow tint in the Spring at the time of putting forth its young branches. One observes, besides the arbors, the arches, the benches, and, as was stated a little before, many of the trees in geometric forms, but relatively few in the form of animals. The scene which Sir Frank Crisp has taken pleasure in creating in his park is, on the contrary, exclusively formed of objects the most unusual and the strangest that he could procure. This scene seems to be a creation relatively recent, which is still easy enough in England, for one sees at most of the expositions portions allotted to these topiary trees.

If one compares this decorative style of gardens with the fancy flower beds, long since abandoned; then with the French flower beds, rather on the decline, and finally with the landscape style that prevails in our day in the majority of gardens, one finds himself amazed, not by the difference which separates the first from the last, for it is of such a sort that comparison is useless, but very much by the conception of gardens in those remote periods, and above all by the mentality of the men who constructed them and of those who admired them. They neglected entirely the beauties of Nature and interest in the plants themselves, for it pleased them to realize an ideal of pure imagination, which consisted to a great extent in going contrary to Nature rather than in imitating her. It was without doubt the same mental state that led the Japanese, at about the same time, to dwarf and to render ill-shaped the trees that would lend themselves to this torture.

It is just to recognize that then botany had not been born. Linnæus published his system of classification of the vegetable kingdom only in the eighteenth century. The magnificent vegetable exotics that now adorn our gardens were still unknown, or at least not yet introduced. One understands, then, that the gardeners of the period had put their intelligence and their activity to the creation of scenes of pure imagination, designed above all to strike the attention of their contemporaries.

And now can some benefit be reaped for the embellishment of our modern gardens from this ancient style of trimming trees?

As far as hornbeams are concerned, it is evident that they render still signal service in screening certain places, in separating parts of the garden quite distinctly and in forming arbors, etc. Topiary trees can, if their form is simple and geometric, occupy, as do vases and statues, certain selected places in the large flower beds, in the vicinity of mansions and of the most important dwellings.

As for the scenes cited, they could hardly fail to find place upon the great and wealthy estates where space is not lacking, and where the architects desire to create scenes of different styles; Alpine gardens, French, Italian, Japanese, or others, fancy flower beds, carpet beddings, augmenting their interest by their extreme diversity, which is true of Friar Park.

On the contrary, we consider that these topiary trees are not in their place when scattered among other trees, as one sees them at times in small gardens, any more than is a rock garden in the midst of a flower border, or Japanese trees upon a lawn.—*Le Petit Jardin* (translated from French).

PRUNING EVERGREENS

EVERGREENS after they have left the hands of the nurseryman and have been planted in their permanent quarters, rarely need much pruning. It is, of course, always in order to prune away the interior dead twigs. In fact, it should be strongly recommended in close growing subjects like *Retinispora squarrosa* and in some of the Spruces or any evergreen that gets an accumulation of dead leaves and twigs in the center, as it is only a harbor for red spider and other pests.

This cleaning out of the centers is really worth while from the apparent beneficial results it has on the plant. Other pruning of well grown plants is scarcely necessary, or at least should be confined to shortening the current year's growth, if it is desired to have them very bushy.

Exception must be made, of course, to topiary work where evergreens are annually clipped into fantastic unnatural shapes. This is a proposition entirely aside from pruning for the welfare of the tree or plant. There is too much clipping done to evergreens. In many places it is an annual operation that could very well be dispensed with to the great advantage in the appearance of the place. Such plants as the common *Retinosporas*, Junipers, etc., are often clipped until the poor things die in despair. Just as soon as the plant puts out its beautiful green foliage in Spring, the would-be gardener clips it all off. If the same labor was directed in cleaning out the inside and merely cutting off with a knife any straggling twig or branch, the specimen would be much more pleasing in shape if allowed to resume its natural habit.

Of course, evergreens in their young state have to be trained and pruned until they can take care of themselves. In subjects like *Retinospora plumosa*, *pisifera*, *squarrosa*, and some of the Junipers it is well to select and stake the leader while young, then shape them with a knife, shortening back the strong growth to make the plants bushy and prevent them from having more than one central axis or leader. If more than one leader is allowed to grow the plants open up with the weight of the snow and become very unshapely as they become older.

The growth will always be stronger at the top of the plant, and while it is young it is advisable to annually reduce the young growth, encouraging the lower branches to fill out and get a well balanced plant.

The real skilled workman knows the characteristic shape of each variety of plant he wishes to prune, and acts accordingly. Too often men without any knowledge are given a pair of shears and turned into a block of evergreens to shear them into shape. In spite of such treatment plants often develop into fine specimens, but if they had been helped more intelligently the size and their own beautiful character would have been developed to much greater advantage without the annual shearing.—*The National Nurseryman*.

Tropical Ferns

RALPH C. BENEDICT

WHAT special interest attaches to ferns that they should be made the center of an exhibition such as was held by the Massachusetts Horticultural Society? They bear no flowers; they rarely show any coloring other than some shade of green; they produce no products of any real commercial importance. In what particular traits or characteristics does their hold upon us lie?

"Nature made ferns for pure leaves." So wrote Thoreau, and today the scientist can scarcely better that expression. Fern leaves represent the supreme development of the leaf organ among plants. In no other group of plants are leaves carried to so high a state of perfection. Other plants may bear flowers of rare beauty of

mountains in search for rarer species. The fact that one may in a season or two make the acquaintance of the entire fern flora of a given state is perhaps one element of interest. Our native ferns are generally relatively few in number, select in their associations, and particular in their surroundings. You have never seen ferns troublesome as weeds.

One element of interest attaching to ferns lies in their antiquity. Geologically they are the most primitive of the larger land plants. The vegetation of the Palæozoic period included a considerable proportion of ferns. Coal represents in large part the solidified carbon of fern plants perhaps 100,000,000 years old. None of our flowering plant types is half as old.



(Courtesy of W. A. Manda)

General View of the Main Hall at the Boston Fern Show.

shape and color, but flowers are ephemeral. The most highly prized of all flower types, the orchid, is shown for a few days or weeks on a plant which throughout the rest of the year is more often than not a vegetable monstrosity. A fern plant, from the period of unfolding throughout healthy growth, is an object of beauty which compels interest, a decoration at home in its native woods, in a shady spot in the garden, or in the house or conservatory.

That "the chief charm of ferns is in their surroundings" was the opinion of Mrs. Parsons, expressed in her book on native ferns, and probable many lovers of our native ferns would agree with this view. Hundreds of individuals, scattered over the country, ride ferns as a hobby through cool woods and ravines, up cliffs and

Today ferns are found wild chiefly in the tropics, although they can live wherever other plants can grow. Two or three species range north of the Arctic Circle. About fifty kinds are found in all Canada. In the United States, almost any single state may count as many within its borders, while Florida, partly tropical, has over one hundred kinds. It is, however, only in the real tropics that ferns abound. Given warmth, ample rainfall and considerable range in altitude, even a small area may have more than the whole United States. Jamaica, for example, has about five hundred fern species, over twice the number found in the United States. The Andean mountain range, from Mexico into South America, is the home of hundreds, thousands of species, many of them yet to be collected and described.

Among this legion of species, there exist all possible differences in size, leaf shape, habit of growth, *et al.*, from tiny Monogramme, with its thread like leaves, to a giant tree fern with a stem eighty feet tall and leaves spreading twenty-five feet, and many times divided. What characteristics do these extremes, together with the multiplicity of types between them, have in common? In other words, what is a fern?

If we examine a mature fern leaf, we may find our answer most simple. No matter what the general shape or size of the leaf may be, there are two characters which are always distinctive. First, fern leaves develop from the bud by unrolling, much as one might uncoil a watch-spring. Second, fern leaves bear spores, generally on the back of the leaf. The leaves of flowering plants never produce spores. Spores are microscopic cells by which new plants may be produced. They are always produced in tiny spore cases (*sporangia*) which are arranged in dots, lines or patches. It is on the basis of the arrangement of the spore cases that scientists classify the thousands of fern species. Secondarily, of course,

The widest and most popular appeal of ferns lies in their availability as plants for the house or conservatory. For this purpose millions of plants are grown every year in the United States. The choice of the proper kind to grow depends on the surrounding and care that can be given. There is no plant that can thrive or even live in a poorly lighted room filled with the fumes of burned illuminating gas. Given good conditions of light and air, and reasonable attention to the thirst of the plant, there are several species of ferns which may be expected to live and continue to grow reasonably well in an ordinary dwelling.

Our native ferns do not give us any good house plants. Many people will testify to this after trying repeatedly to domesticate some fern of the woods or mountains brought home from some vacation or holiday trip. Such plants may maintain a good appearance for some weeks and so serve a useful purpose, but they cannot be expected to continue indefinitely as they were, or to make any vigorous new growth. Among tropical ferns there is a great deal of variation in adaptability to house cul-



Courtesy of W. A. Manda

Collection of Seven Vases of *Cibotiums*, Filling a Large Corner of the Hall. Exhibit of W. A. Manda.

classification is based on the shape of the leaf, whether it is undivided or simple, once divided or pinnate, or two, three, or more times divided.

The development of a fern spore is interesting but rather obscure. If sown under proper conditions of soil, moisture, etc., each spore may grow into a flattish green scale, about half as big as a little finger nail. These may often be found in greenhouses, growing on the sides of pots which are kept moist. This scale (*prothallium*) lives independently, and may eventually produce sex organs and cells. With the union of the latter, a beginning of a new ordinary fern plant has been made.

We may distinguish a few as best for the home, but recognize that others are worth buying in the form of the beautiful plants raised by the florists to be renewed from time to time as one buys fresh flowers.

The number of kinds one may grow can be considerably extended if conservatory space is available, or if a miniature conservatory, the so-called Wardian case is used. In Bailey's "Cyclopædia of Horticulture," approximately four hundred and fifty species are described as in the American trade or likely to come into it. The current catalog of an English fern grower lists over two thousand species and varieties as offered. It may be

noted that fern growing as a hobby has a much greater following in England than with us, difference in climate being perhaps partly responsible.

In considering some of the actual fern species which may be grown, we may separate them into two groups as "house ferns" and "conservatory ferns." The house ferns also come naturally under two headings, as "table ferns," or fern dish species, and Boston fern varieties.

TABLE FERN VARIETIES

Table ferns include ordinarily about a dozen different kinds. The plants are raised from spores by the million, and sold in small sizes for filling fern dishes for table decoration, often with a small palm as a center. The fern dish as made up is always a temporary decoration which needs refilling every few weeks, both because the plants are too crowded at the start, because some of the ferns are not adapted to continued house growth, and because fern dishes are rarely given a position in a room selected from the fern's standpoint. When the occupants become too large for the dish they may be repotted into separate pots and continued as house plants, if conditions are good. Most of them will do well as individual plants, always excluding conditions of poor air, poor light, and poor care.

Cyrtomium falcatum, the Holly fern, is grown in several varieties, *Kochfordianum* being most popular. The plants show a circle of bright green, glossy, thick leaves, springing once a year from a scaly center. It is a native in Japan and elsewhere in the Orient, and some strains are hardy as far north as New York.

Polystichum tsus-sinense (sometimes misspelled and mispronounced "ten-semense") comes, as its name indicates, from the Tsus-Shima province of China. It produces a bushy growth of dark green, narrow, pointed leaves about fifteen inches high.

Pellaea viridis, one of the rock brakes, is native in South Africa. It bears slender stalked, graceful leaves, somewhat suggesting a maidenhair.

Adiantum cuneatum, the commonest florist's maidenhair fern, is very justly prized for the delicate beauty of its leaves, but is unfortunately not well adapted for house culture.

Pteris cretica, in its varieties *Wilsoni*, *Rivertoniana*, and others, *Pteris serrulata*, *Pteris ensiformis* *Victoria*, and *Pteris quadraurita argyrea*, are frequently seen as table ferns. All have leaves with long slender leaflets, spreading somewhat like the fingers of the hand, and growing about fifteen inches high as ordinarily grown. Several of the varieties are variegated, a rare condition among ferns. Most of them will do well in good house conditions, although several require greenhouse culture.

BOSTON FERN VARIETIES

The Boston fern and some of its varieties are so exceptionally good for house plant use that they are raised and sold for this purpose almost to the exclusion of any other ferns. Discovered twenty-five years ago as a new variety of the wild sword fern, *Nephrolepis exaltata*, the Boston fern has come to be the most popular of all house plants.

About five years after its recognition, the Boston fern began to give rise to new varieties of which Anna Foster and *Pierstoni* were first. These are little seen now, but other later forms are deservedly popular, *Scotti*, *Roosevelti*, *Teddy*, Jr., *elegantissima*, *Whitmani*, *Verona* and *Smithi*. Nearly one hundred named varieties of Boston fern have been introduced, others are still appearing, but the varieties named above are probably the best for continued growth in the house. The last two, finely continued growth in the house.

CONSERVATORY FERNS

Conservatory ferns include all except the hardy species, and most of these may grow well under glass in cool house or cold frame conditions. The whole fern class is divided by scientists into twelve families; these are further divided into over one hundred and fifty genera, with

a present total of known species of about seven thousand. In other words, there are a possible total of seven thousand conservatory ferns, not including the hundreds of horticultural varieties. Besides these we may note two groups, sometimes mistakenly called fern allies, which are usually listed with ferns. These are the selaginellas and lycopodiums, related to the Christmas greens, ground pine, and the horsetails or scouring rushes. The latter group is without horticultural significance, but selaginellas are of considerable importance and form beautiful conservatory plants.

MARATTICEÆ; include two well-known horticultural genera, *Angiopteris* and *Marattia*, ferns with coarse leaves which may reach twenty feet in length. Easily grown and propagated.

HYMENOPHYLLACEÆ, or filmy ferns. There are five hundred species in two genera, *Hymenophyllum* and *Trichomanes*, noted for the extreme delicacy of their leaves, which may be actually transparent. All small ferns requiring special cultivation, even in a greenhouse.

CYATHEACEÆ, the tree ferns. Include six genera, with four—*Alsophila*, *Cibotium*, *Cyathea*, and *Dicksonia*—best known in cultivation. The tree ferns are the noblest of all ferns. Picture such a plant with a crown of beautifully divided leaves many feet in length, borne on a slender unbranched trunk. Some tree ferns grow to a height of eighty feet; others are low with only a short stem. Over five hundred species have been described. Best known of these are two or three species of *Cibotium*. The large fern often seen in the windows of retail florists' shops, a single plant nearly filling a whole window with its pale green leaves, is generally *Cibotium Schiedei*. The "Scythian Lamb," a Chinese wonder of the days of Marco Polo's successors, was a plant-animal which grew supported on an abdominal cord, and fed by rotating on this until it had eaten all the vegetation within reach. In reality it is a "tree" fern with a reching trunk densely covered with brown woolly scales.

OSMUNDACEÆ, the "flowering fern" family, has three genera: *Osmunda*, with three common native hardy species, and some tropical kinds, *Todea* and *Leptopteris*, Australasian, the latter with filmy leaves. The whole family has only about twenty species.

SCHIZACEÆ. This family has four genera and over one hundred species, some of odd character. The best known in cultivation are species of *Lygodium*, the climbing ferns, whose leaves have a very extended growth, sometimes twining and climbing one hundred feet in length. Others, like our native hardy *Lygodium*, the Hartford fern, reach only a few feet in length.

POLYPODIACEÆ, with more than one hundred genera and about five thousand species, includes all our commonest ferns. So many of these are important horticulturally that only a sketchy account can be attempted. The family is divided into "tribes" according to the arrangement of the spore cases on the backs of the leaves.

In one tribe, those spore cases form large patches. Here we find one of the oddest leaved but most prized of fern genera, *Platynerium*, the stag-horn fern, with a dozen species, and with leaves very suggestive of the antlers of a deer. Another tribe has round uncovered "dots" of spore cases, and includes *Polypodium*, the largest of all fern genera, with perhaps a thousand species, many important horticulturally. Another tribe with marginal lines of spore cases includes *Adiantum*, or maidenhair, with one hundred species; *Pteris* with one hundred and sixty; *Ceropteris*, the gold and silver ferns, and other well-known forms.

In yet another tribe we find *Asplenium*, *Blechnum*, *Diplazium*, and others, all well known as beautiful ferns. Another tribe gives us *Cyrtomium*, with the common table fern species already mentioned, *Polystichum* and *Dryopteris*, with hundreds of species, a genus second in size to *Polypodium*. In the tribe with *Nephrolepis*, and the Boston fern, there are other important *Nephrolepis* species, and also *Dennstaedtia*, *Odontosoria*, and *Davallia*, one of the most highly prized types. *Davallia* includes with others two species sold as "fern balls," which are made-up arrangements of the creeping stems of two Japanese species, put together while in a resting condition. When given water these stems renew growth and become covered with delicate finely divided leaves.

CERATOPTERIDACEÆ, **SALVINIACEÆ**, and **MARSILIACEÆ**. These are three families of water plants. *Ceratopteris* has five species, fern-like in appearance, with two species in use in aquaria. The *Marsiliaceæ*, also aquatic, has one genus, *Marsilia*, with two cultivated species whose leaves are like four-leaved clover. The *Salvinia* family, with *Salvinia* and *Azolla*, are little floating plants, unlike ferns in looks but really related to them. *Salvinia* has two rows of roundish hairy leaves, less than an inch long. *Azolla* is much smaller. A whole plant is less than an inch

(Continued on page 772)

Length of Life in Plants

WILLARD N. CLUTE

THE customary classification of plants as annuals, biennials and perennials is more a matter of convenience than an expression of the exact situation with regard to the length of life in plants. The majority of annuals, for instance, do not live for even a full year. A single growing season often measures their span of life and many others, such as the little whitlow grass (*Draba*), are able to condense their whole existence into a period of five or six weeks. On the other hand, some of our annual weeds spring up in Autumn and passing the Winter as seedlings mature their fruits the following Summer, thus living in two growing seasons but seldom existing for more than a year. These latter plants are often called "winter annuals" to distinguish them from the more common kinds, which begin their growth in Spring. The wild lettuce is naturally a Winter annual and wheat becomes so when sown in the Fall.

The biennial is another mental conception rather than a plant entity. As commonly understood it is a plant that requires two years for the completion of its life cycle, but after a consideration of its behavior we see that it is really two growing seasons, rather than two years, that are involved. This point is important because in warm regions, where the growing season is longer, there are practically no biennials. There they are able to complete their work in a single year. Moreover, in any considerable area devoted to the so-called biennials, it is not uncommon to find specimens that are able to fruit the first season. The essential thing is the way in which food is used. One group, like the goldenrods and asters, make their food as they go along; the other accumulates a store of food before blooming. The biennials belong to this latter class. The garden radish clearly illustrates the process, first storing food in its large root and then producing flowers and fruits. It differs from the biennials, however, in compressing all its activities within a single growing season. The storage of food by the biennials is what makes them such important food plants. We simply appropriate the food-stores before the plant has had time to use them.

While the biennial garden plants are the most familiar instances of food storage before blooming, they are by no means the most remarkable. Many other plants require not two years but many years, before they are able to put up a flower-spike. Of this class the century plant is a fine example. It is commonly supposed that such plants require a hundred years of growth to come into bloom, but however this may be in conservatories, in their native haunts from ten to twenty years is usually enough. The talipot palms of the Old World come much nearer being century plants for they often live for fifty years or more before blooming. Like the annuals, however, when once they blossom, they rapidly decline and die. The common yucca is another example of this group of plants, but it is to be noted that the yucca and several others do not die after flowering. The part that bears the flowers dies, but from the base of the old stem new sprouts are put forth which carry on the work. The yucca then, is a sort of perennial with many of the characteristics of an annual.

The feature that distinguished the true perennials from the classes already mentioned is not the fact that they live for a term of years but that they bear flowers and fruits more than once. Considered from this angle, we see that a more definite dividing line is possible. It is easy to

make two groups of all flowering plants depending upon whether they bloom once or more than once. Those which bloom but once are known as monocarpic plants and the others are called polycarpic plants. But just as the line between annuals and biennials breaks down in warm regions, the line between monocarpic and polycarpic plants breaks down in a cold one, at least in the case of polycarpic plants transferred from one region to the other. Many polycarpic plants of the tropics become monocarpic plants when brought into northern gardens. The four o'clock is a good example. This is really a perennial but it so rarely becomes so with us that most people suppose it to be an annual. If preserved from the cold, however, it will quickly resume growth in Spring and come into bloom much earlier than plants grown from seeds. One seven-year-old plant in the writer's possession produced more than five thousand blossoms during the past Summer. Another way in which the line appears to be broken down by the polycarpic plants is by their blooming the first season from seeds. Polycarpic plants are noticeably slower in development than the annuals and biennials. Frequently it is possible to decide whether an unknown plant is a perennial or not by the comparative rapidity of its growth. Most perennials do not bloom the first year from seed and many vegetate for fifteen years or more before putting out the first crop of blossoms. There are a number of polycarpic plants, however, in which the ability to produce more than one set of blossoms is not very firmly fixed. The hollyhock, the snapdragon, and many columbines, pentstemons and pinks are good illustrations. After the first full season of bloom they tend to disappear though with care they may be induced to bloom for a series of years. On the other hand, there are others that frequently bloom twice in the same season, especially if, as in the past Summer, conditions are such as to nearly check growth in Midsummer. A wet Autumn makes a second Spring in which great numbers of plants bloom again. I have found all of our Spring flowers blooming thus in different years.

From the fact that annuals and biennials are most abundant in cold or dry regions it seems pretty certain that such forms are a response to peculiar climatic conditions in their environment. They are able to persist in regions where a part of each year is hostile to growth by springing up and ripening their seeds before the inhospitable season overtakes them. Moreover, in such situations they are practically relieved from the competition of the stronger perennials which usually overwhelm them in more inviting situations. In the tropics the vegetation is prevalently woody. It has been estimated that in some sections only 12 per cent. of the flora is herbaceous. Annuals of any kind are naturally extremely scarce. When annuals do occur in favorable regions, their short term of life is also of advantage in giving them more mobility. Most gardeners can call to mind perennial plants that appear to avoid spots in which they have once grown, each year spreading away from the center until they form what in simpler plants are known as "fairy rings." Annual plants find it easy to desert such a place. The trees of all others appear to be in the worst case because they cannot get away, but it must be remembered that their roots spread away from the center like the others and thus while the main body remains, the roots ever feed in new regions. (Continued on page 773)

November Birds

PAUL B. RIIS

INDIAN Summer, rare gem of Autumn, coy and elusive, rarely shows her golden smile in a succession of delighful days, but rather prefers to present us with a day of her making now and then at her own chosen time. The hazy atmosphere mysteriously veils distant trees, hills and valleys into dreamy compositions, merging the vermilion hues of the horizon with the boundless spaces of the infinite. Then Autumn's glory is reflected in the mature foliage of the trees in colors of gold, bronze, russet and scarlet stretching away in the vapory distance. A few days, a week or two at most, to become but a memory, conquered by the vanguard forces of King Boreas.

But few as the Indian Summer days may be, always are they days of wonderful beauty. The air, crisp, aromatic and invigorating, entices our steps to our favorite haunt, the spring-fed brook, peculiarly attractive during the reign of Boreas. The glory of the forest and the woodland is departing, the vivid scarlet and rich bronze are making way for the dull brown and purple, many trees standing revealed in rugged symmetry. The singing waters of the brook too are responding to the change, their soft, musical laughter lost in the empty spaces. Friendly and cheery sounds the greeting of the chickadee, whose modest advances we have ignored these many months for birds with greater lyrical accomplishments. They have come in the cheerless hour and it seems but now that we appreciate the sincerity and the sweetness of its simple call. In close proximity we find other cold weather friends, the hairy and downy woodpeckers, industriously engaged in their respective endeavors and callings. A makeshift feeding station placed here and well supplied with suet, hemp, millet and sunflower seed is entertaining such stable boarders as the white-breasted nuthatch, brown creeper and red-headed woodpecker, the latter competing vociferously with a protesting blue jay in the storing of the meaty sunflower seeds. A song sparrow and a carefree goldfinch, scarcely recognizable but cognizant of the enticing supply, have joined in the repast, snatching a seed or two whenever satiety relaxes the vigilance of the greedy nuthatch. A red-breasted nuthatch plaintively ranging the vicinity, on flashing wing scoops up a seed and is gone; we watch it closely transferring the seed from the beak to its toes where a few deft and vigorous pecks expose the delectable meat within. The juncos, retiring and unassuming, are contenting themselves with the seeds scattered far and wide from the feeding board.

The smoky atmosphere of Indian Summer caused by decay and slow chemical combustion of leaves and vegetations under action of heat and frost is the vapor and smoke from Nature's own furnace in full blast. Here incineration and reduction takes place and great masses of waste matter are turned back to serve as plant food. Involuntarily other forces are silently distributing the seeds over this fertile seed bed. We note the thick growth of young sheepberry under a group of trees where we were wont to meet our silent acquaintance, the cedar waxwings, and happily we find them again this day keeping tryst. Stirred by a gentle breeze the samaras of the wafer ash is simulating the quaking aspen, but we pass on in search of the author of familiar tinkling notes, the tree sparrow, whose merry choruses are sparkling frost crystals turned to music. Unconcernedly they mingle with the junco in perfect harmony. And right here we note a strange bird, two of them, nay, a number; their

sides are distinctly striped with brown, the rosy breast melting into dawn. The scarlet brown cap all too distinctive, admits of no mistake in identifying the newcomer, the redpoll. And presently, accepting our harmless intrusion, they entertain us with their sweet confiding song.

A robin, a few bronzed grackles and a flock of rusty blackbirds are passing up the valley and here on the shore of the brook we surprise again our intrepid Winter wren, dripping from the interrupted bath. The rustling of the leaves for a moment betrays a startled chipmunk enjoying the luxury of a sunbath. The knothole overhead bulging with hoarded acorns contributes to his seeming contentment. As we saunter on we note with interest the ripening stems of the meadow rose, the dogwoods and the brambles, and venture a guess at the display yet to come when the immaculate mantle of Winter covers the earth. Already the swelled buds of the mandrake and wild ginger protrude above the ground, ready to break into leaf and blossom, and the ferns, protected by the withered crown, harbor new leaves and gather strength from the dormant roots. Other things, too, we note, but the lengthening shadows, ghostly shafts in the dusk of the deep woods, the heightened colors of certain tree trunks, accelerate our homeward steps.

The bird movement in northern Illinois during November is more clearly illustrated in the appended list. This list is compiled from records of many Novembers but serves to portray the bird life of our region.

DEPARTURES SOUTH		Nov. 17	Bluebird.
Nov. 1	Myrtle Warbler.	Nov. 20	Fox Sparrow.
	Coot.	Nov. 22	White-throated Sparrow.
Nov. 2	Phoebe.		Canada Goose.
	Cowbird.		Marsh Hawk.
Nov. 4	Green-winged Teal.		Red-tailed Hawk.
	Ruby-crowned Kinglet.	Nov. 24	Horned Grebe.
	Spotted Sandpiper.	Nov. 26	Red-breasted Merganser.
Nov. 6	Virginia Rail.		Mallard.
Nov. 7	Ruddy Duck.		Red-winged Blackbird.
	Towhee.		Bronzed Grackle.
	Western Meadowlark.	ARRIVALS FROM THE NORTH	
	Swamp Sparrow.	Nov. 2	Loon.
Nov. 9	Yellow-billed Cuckoo.	Nov. 4	Redpoll.
	Pipit.	Nov. 8	Horned Grebe.
Nov. 11	Vesper Sparrow.		
Nov. 13	Lapland Longspur.		
Nov. 15	Song Sparrow.		

TREE LORE

MANKIND had long associated plants, and especially trees, with mystic influences, and almost as far back as the beginning of history we read of the sacred character ascribed to trees and the part they played in forms of worship and sacrifice. Mr. Ernest V. Laing dealt with many of the myths and legends associated with trees in a paper read at a meeting of the University of Aberdeen Forestry Society. A beautiful tree in its full grandeur is capable of casting a spell over the beholder, but, as Mr. Laing states, there is a wide gulf between the man who loves trees either with the instinct of an artist for the beautiful or the love engendered by memory and association, and the man who is admiring something which he has never seen before equalled in strength or beauty. He illustrates this distinction by the classical incident of Xerxes and the celebrated Phrygian Plane. The warrior was so impressed with the size and majesty of this tree that he halted his army for three days at Phrygia in order to pitch his tents under the branches. The three

days were sufficient to enable the Greeks to put the defences of Thermopylæ in order, with results so well known. Among the ancients a belief existed that trees were conscious personal beings, and this belief found expression in sundry acts of worship and sacrifice. The longevity of trees also impressed the credulous, and it is recorded so recently as the beginning of the nineteenth century that De Candolle expressed a belief in the immortality of trees, which he stated did not die of senile decay, but only as the result of injury or disease. The healing or harmful properties of trees may serve to explain in some measure the reason for tree worship. The twigs, leaves and bark were sometimes supposed to contain an in-dwelling spirit or demon, according as they were beneficial or malignant to the receiver. Thus some trees were to be avoided, and others revered for their healing properties. Hence we find that the tree of life or immortality occurs in many mythologies. The fruit of the Chinese tree of life is given by fairies to their favorites, and they then become immortal. The Polynesians believe the dead assemble on a huge tree with dead and living branches and only those who tread on the living branches come back to life. In all these myths Mr. Laing sees nothing more than the imaginative extension of the use of plants and herbs and leaves of trees in the medical lore of all races, aided by the universal custom of tree worship. In Australia and the Philippine Islands it is affirmed by some of the natives that the good folk are transformed into trees at death. Belief in tree souls and tree spirits is common in many parts, as when the southeastern Asiatic prays before cutting down a tree, the tree being considered as having a demon or spirit. African negroes likewise cut down certain trees in fear of the anger of their inhabiting demons. In Africa also trees are prayed to and sacrifices offered to them in time of sickness. The Siamese believe that by offering cakes and rice before felling a tree, the propitiated spirit passes into the boat made from its former residence and becomes its guardian spirit. North American Indians hang offerings on trees or place them on rocks to propitiate the spirits and procure good weather and hunting. In some parts of the East a tree is supposed to be capable of diverting or taking ill-luck to itself. Thus in the Punjab, if a man has lost several wives in succession, he is married to a tree before another marriage; and the tree is assumed to die in the place of the woman. Many tribes in India observe the custom of marrying both bride and bridegroom to trees as a preliminary ceremony; perhaps to divert all evil influences to them, or possibly with a view to obtaining good luck from them. Many remnants of primeval forests remain as a result of the sacred character once associated with trees, and especially groves.

Names like Holy Oak and Holy Rood record old memories of trees and groves. It is interesting to know that it was a great and sacred Lime tree, or Linden tree, with three stems, standing in South Sweden, which gave the name of the family of Linneus. Much interesting mythology associated with our own familiar trees is dealt with by the writer of the paper. He deals a subtle blow at the legend of the speaking Oak by suggesting that it was a hollow specimen in which a priest might be concealed. The association of the Mistletoe with the Oak being such a rare occurrence, Mistletoe growing on the Oak was regarded by the Druids as indicative of the peculiar favor of heaven, and trees on which it grew were regarded with religious reverence. Although it is difficult to account for the Mistletoe being so rarely found on the Oak in this country, the legend exists that all Mistletoe growing on Oaks was destroyed after the last of the Druids were gone. Mr. Laing considers that it is possible that

the Mistletoe of the Druids may be confounded with a species of *Loranthus* which is often found in association with Oak trees in England. In dealing with the Wych Elm the author gives the most likely derivation of the word "Wych" as meaning "salt," and that the trees were so called by our Saxon ancestors owing to the fact that they may have been found growing in the vicinity of salt springs. It is probable that the similarity of the name to "witch" gave rise to some of the superstitions connected with the tree, and its name may have arisen thus. It is interesting to learn that in olden times much tea was adulterated with Elm leaves and the bark of the English Elm was used for cleansing the skin and making it fair, whilst the water in which the roots were boiled was used to prevent hair from falling out. American Indians regarded the Beech as a non-conductor of lightning, and in a thunderstorm always took refuge under its boughs. The same quality of being a non-conductor of lightning is said by the people in certain parts of Russia to be possessed by the Birch.—*Exchange*.

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 762)

Ethelfleda's Mount is a mound of artificial construction, possessing great interest both for the antiquarian and the gardener. Ethelfleda, daughter of Alfred the Great, is said to have erected a keep, or dungeon, on the mound in the year 915. At the present time, the mound is devoted to a more peaceful art, for its slopes are tastefully planted with a collection of trees and shrubs admirably disposed so as to secure the greatest effects obtainable from contrasting foliage, both in color and texture.

Reverting to the guide-book again, we learn that the park attached to the castle comprises an area of seven hundred and two acres, or somewhat more than a square mile, of which about thirty-six acres are laid out, or included in, ornamental grounds. But according to Mr. Smail, its dimensions are much larger—about seven miles in circumference, and comprises approximately about twelve thousand acres. It is sometimes hard for Americans to realize that estates of this size are to be found on a group of diminutive islands such as *Great Britain* and *Ireland*. The park is well wooded and many charming views can be obtained from points of vantage in the castle, and from the castle walls. The river Avon, flowing through the estate, provides an attractive and picturesque feature of the landscape.

TROPICAL FERNS

(Continued from page 769)

long, but they sometimes grow so thickly and cover the surface of standing water so densely as to be of use in destroying mosquitoes.

Selaginella and *Lycopodium* deserve consideration here because it is common practice for botanists and horticulturists to group them with ferns. Both have slender stems with scale-like leaves, but through their varieties of branching and coloring, very beautiful plants are formed, in *Selaginella* particularly. Here we have *S. emiliana*, a compact grower, about a foot across the rosette, bright green or clear yellow in the variety *aurca*. This is commonly offered for sale as a house plant, but is difficult to keep long, owing to its sensitiveness to any irregularity in watering. In *S. casia* or *uncinata*, we find a beautiful metallic blue green foliage.

Nothing is denied to well-directed labor; nothing is ever to be attained without it.—*Guizot*.

The Greenhouse, Month to Month

W. R. FOWKES

NOVEMBER is the most interesting of all periods to greenhouse lovers, for we begin to observe some reward from our labors. Chrysanthemums are arrayed in all their glory, and we must choose the varieties we desire to grow next year. When finished blooming, cut down to within three inches of the pot. Save several of each kind, placing them in a very cool house with full light and air. Remember that next year's flowers are to be grown from these cut-backs, so they should be kept perfectly clean and fairly dry. Fumigate once weekly.

Plant the sweet peas from pots on a vacant bench, and support them at the same time. Remember that one good watering at planting-time and the avoidance of a stuffy atmosphere will materially aid in warding off stem rot.

Take the pot fruit trees into their Winter quarters and see that the roots are moist.

Tomato plants should be in a light position. Maintain a fairly dry atmosphere with top air, and fumigate every fortnight with cyanide of sodium to steer clear of white fly. Dust occasionally with grape dust to keep free of *cladysporum*. Do not over-water. Pick off side shoots, being careful in so doing that you do not leave a blind plant, as often happens in tomato culture. Lime should be applied under damp benches.

In the orchid department leaves from outdoors should be scattered on any very dry parts of the bench or underneath, where the heating apparatus, connected to another part, sometimes causes a hot desertlike atmosphere so fatal to these children of the free and open forest.

Aspidistras should be now divided if a stock is required. They make a quicker growth in a light compost, but the leaves will be dull green. We like to have variegated leaves on these useful house plants, so we use plain turfy loam and sand, and no humus.

Sow *Corcopsis* in a cool house, also *Gypsophila*, and they will be very attractive for decoration. Grow Clarkias, of good named sorts, very cool, in a gentle heat and in light sandy soil, without fertilizer. They are too fragile for that.

Do not over-feed any kind of plant, as we are now in the dull season. November's dull, sunless days leave their gloomy train in the somewhat dull color of the roses; so, to counteract that condition, water with soot-water of the genuine Scotch brand. Take all useless wood from the rose bushes. Tie them up carefully, for if they are allowed to hang about, they will only court black spot. Pick off every yellow leaf, and do not apply sulphur to any great extent or you will have incessant leaf dropping.

Plant a corner with the Tarrytown Snapdragon—it is a wonder. I saw it a short time ago at M. Rionda's estate, Alpine, N. J. This snapdragon is very free from disease and a wonderfully free bloomer.

If you stop picking buds off cyclamens, you will have fine plants for Christmas. A little soot water should be given to them once weekly.

Keep Christmas Cleveland Cherries cool, and poinsettias warm. If the latter are somewhat behind, instead of re-potting, give a watering of nitrate of soda, a teaspoonful to a gallon of water, every ten days.

Carnations should never have the ventilators closed and remember that some varieties like Beacon have very small roots to support a heavy top. For that reason, one cannot be stingy with water or a harvest of splits will be reaped. Remember also in the matter of fertilizers that carnations can be fed up but never dieted down. There is no anti-fat remedy for over-fed plants.

Pot up some lilacs for forcing, and set them in a cool place for six weeks.

Clerodendron Fallax is now showing forth its bright scarlet blossoms, a fitting companion for the Euphorbias. This plant is easily raised from seed and is almost indispensable for mid-Winter blooming.

Calanthes should be placed on a shelf and kept fairly dry. When the charming buds begin to unfold, no moisture must come in contact with them, or their long protracted sojourn will be terminated.

Mignonette, if sprayed with Pyrox, will not be so liable to an attack from the green caterpillar, which devours so many of these beautiful plants. Tie up each shoot to a neat stake and disbud in order to obtain a high percentage of first class spikes of bloom.

Tuberose should be started in four-inch pots in very sandy soil. Rub off all offsets and clean the base of the roots to avoid decay.

Gloxinias that have been sown and transplanted, can be rested, if one does not desire them to bloom early.

Lilium formosum for Easter should be kept cool and clean. *Lilium Harrisii* for Christmas must have a night temperature of 65° to 70°. Spray every week and avoid chills from cold draughts or disaster will occur.

Cucumbers need warmth and moisture, or failure will result. A lighter house and lighter soil is required than during warm weather. Pots or shallow boxes are preferable to a heap of compost.

Sow lettuce and cauliflower for succession; also mustard, cress and twenty-day radish.

LENGTH OF LIFE IN PLANTS

(Continued from page 770)

Just what it was that first called the annuals into being may remain undiscovered but we can easily see that in many plants the habit of dying after reproducing has become fixed. The process of seed-bearing is an exhausting one and many plants fail to survive it. Even in such woody perennials as our fruit trees it is evident that a year of heavy fruiting is succeeded by a year of scarcity because the trees have to rest and recuperate.

Be it little or much that you win on earth,
Let it have the stamp of your own good worth;
Be able to say of each treasure fine,
I have worked for this and the thing is mine.
Be willing to toil and be willing to give
And honor shall follow you while you live,
For there's none so mean on this globe as he
Who looks to another to pay his fee.

Work for the Month in the Garden

SAMUEL GOLDING

NOVEMBER terminates the growing season. This Fall has been truly remarkable for its wonderful weather, and has been favorable to all gardens. The absence of frost has been a real asset to our Winter supply of vegetables, while the Fall flowers have been exceptionally beautiful and the lovely coloring of trees and shrubs have been most pleasing to the eye.

Although the growing season is ended, there is still much to be accomplished. Therefore, such crops as beets, turnips, cabbage, etc., should be lifted and stored away in the root cellar, but failing this, they may be placed in shelters constructed outside, which are easy of access and frost-proof, and they can be made so by leaves and cornstalks. Cabbage can be lifted and placed head downwards, forming a conical stack, and covered with protecting materials if one lacks a cool cellar.

After the first killing frost, we realize the great value of a good supply of celery, to enable us to carry on during the long Winter months before us. No chances should be taken by leaving it without adequate protection in case of sudden frost, and therefore it should have been earthed early in the month. Opinions differ somewhat on the matter of procedure for Wintering celery. To lift or not to lift is the question. Celery that is protected in the trenches as grown and lifted when wanted for use, is, in my humble opinion, superior for table use, retaining its flavor and crispness in a marked degree over those which may be stored in cellars or packed in the pits. On the other hand, it saves much time and is more convenient to handle when in the cellar. If left outside, the rows should be filled with dry leaves, with some planks alongside to throw off water, and to admit air during mild weather. When this is covered with Nature's blanket of snow, it will defy many degrees of frost, but one must bear in mind the nature of soil, and the situation before deciding to leave it undisturbed. It might prove disastrous should the site not be well drained or flooded during sudden thaws.

Lift and store in a cool place a supply of parsnips and salsify before the ground becomes frozen too hard. Frost does not injure these roots, so they can be left in the ground and lifted when needed, providing a heavy mulch is used to keep the ground open.

Lift horseradish and seakale. The last named should be cut into convenient lengths for forcing, four to five inches, bringing it into heat in successional batches throughout the Winter. The same conditions of culture will suit this excellent vegetable as one adopts for forcing chicory. Some bottom heat is preferable, and if it is not perfectly blanched it is practically useless.

Lift asparagus crowns for forcing when needed; cover spinach with salt hay when severe weather sets in, and bring in successional batches of rhubarb and chicory as the wants of the particular establishment demand.

Push forward with digging and trenching at every opportunity when conditions and time permit. This brings its own reward by improving the rooting medium for next year's crop.

Give abundance of air on every favorable day to pits and frames. Have an abundant supply of covering material on hand in case of severe weather.

Cover strawberry plants with a mulch of rough litter.

Leaves can be used, providing enough cornstalks are used to prevent them from being blown away. Naturally, some judgment must be employed when to apply this protection. To enable the subjects to withstand the rigors of Winter, it should be deferred as long as possible, according to the climatic conditions prevailing, and the ground allowed to be frozen before applying the mulch.

Push on with any planting in the flower garden. Get in all bulbs of tulips, narcissi, etc., without delay, and if lily bulbs are on order, it is a good plan to cover the site where they are to be planted with leaves or litter, to prevent the ground from becoming frozen hard, so that they can be planted as soon as possible after they are received. Preparation also can be made for protecting the more tender subjects, roses, rhododendrons, box bushes, etc. Arrange wind-breaks of cornstalks, and draw up some soil around the base of the most tender tea roses. Should the beds be in an exposed situation, wire netting can be placed around the beds to be in readiness to receive a covering of leaves. Should it be necessary to add this protection, tie straw around the standards, or lift, and cover over with soil in a cold frame.

Give a mulch of litter to newly planted stock. This is better than heavy manure, as the light and air can penetrate and does not hold the moisture in the same way. Manure, under some conditions, may be more of a menace to the health of the plant than the protection it was intended to afford. If one has supposedly hardy plants in the garden and finds Winter conditions unfavorable to them in that particular locality, it is a good plan to lift them and place them in some temporary shelter where extra protection can be given them; for instance, the border chrysanthemums, tritonias, *artemisia lactiflora*, *cupatorium celestinum*, *plumbago larpente*, to mention a few. These may come through well some Winters, according to the nature of the soil in which they are planted, and if well covered with snow. Since many failures can be attributed to successions of frost and thaws, a little extra trouble involved is worth while. Place Canterbury Bells, *myosotis*, etc., in a cold frame, where they can be protected when necessary.

Cut over the herbaceous border; tie up all stakes, and store away for future use, making everything as neat and trim as possible. Burn all the rubbish collected, for the ashes are a valuable fertilizer. Collect all leaves and place in a pile for future use for making up hotbeds and forming leaf soil.

Plant deciduous trees while the ground is open and apply a mulch to newly planted trees and shrubs. Push on with any ground work when conditions permit.

I have noticed that folks are generally about as happy as they have made up their minds to be.—*Abraham Lincoln*.

* * *

Life, for most of us, is full of hurdles. Our success, or failure, depends on whether we learn to overcome difficulties or permit difficulties to overcome us.

Most men who have risen to high places have had to face more than an average number of obstacles; at least they have succeeded in getting over more obstacles than the rest of us.—*Forbes*.

Review of French Roses

By SAMUEL S. PENNOCK

(As already reported, Mr. Pennock of Philadelphia, was the American representative of the Board of Judges at the big rose event of the year in France, the exhibition at the Bagatelle Gardens in Paris. His review of this event is live, interesting and up-to-date, and it is a pleasure and a profit to read this keen and experienced observer's vivid story.)

IN company with J. Edward Moon, we left the hotel in Paris, Wednesday morning, June 15th, taking the Metro to Porte Maillot, then tramped to the Bagatelle Gardens. Unfortunately, we got off two stops too soon and had quite a walk, reaching the Gardens a trifle after nine, when we should have been there at nine.

We found most of the jurors assembled and soon met Monsieur Forestier, who introduced us to the jurors, among them the English representatives.

Paris and the vicinity has had an extremely dry season, with very little rain, if any, since last July, only showers, and of that nature, not really good rain; consequently, the roses were not quite up to their usual standard, although they were well mulched and, no doubt, had been well watered by hand, but this does not take the place of Nature.

The judging was commenced very promptly and each juror was handed a printed list of all the roses to be judged, this list giving the names of the roses, the parentage, the class and the introducer. One list was for the roses of 1920-21 with the scores of 1920 marked up against them; another list was for the roses of 1921-1922. This is a very excellent way of judging all new roses, not only the fact of giving them two years' scoring, but having them in printed form with the results of the previous year.

Probably a good many of the roses would have scored higher, had conditions been more favorable for them. English jurors, like myself, seemed a little more conservative in the giving of points than the French and often-times a vote was necessary to decide. Ten points was the maximum given and only two roses of 1920-1921 scored ten points, and the highest that scored of 1921-1922 roses was one rose, 8 points, and others ranging from 3-7 points. A number of them were not in extra good shape, and were put down as reserve, as the French would put it, which is an excellent plan, as next year they may show up in much better shape.

Each class was judged separately,—first, the 1920-1921 and then the 1921-1922. To some of us the judging seemed to be in some instances rather hurriedly done, although taken as a whole, we believe each rose was given what it should receive.

The rose that stood out in the Gardens head and shoulders above any other rose was a bed of Pernet-Ducher's H. T. Gold Medal rose of last year, *Souvenir de Claudius Pernet*, named in honor of his son, whom he lost in the war.

There were also a few plants mixed in the bed of Pernet-Ducher's H. T. rose, *Mme. William Marcel Delaney*, a medium pink, with very full large flowers.

Claudius Pernet is certainly a wonderful rose, a rich canary yellow, fading out as it gets older to a lighter shade; large, full; long, well-shaped bud, as large as any H. T. rose in the garden. These flowers were borne on fair length stems, well foliaged, holding their heads perfectly erect. It certainly was a joy to see this bed and was well worthy of the name it bore. It is too bad that this rose is not a forcer, but the consensus of opinion

seemed to be that it was not, and would go to sleep in the Winter time. In fact, I saw it growing at W. T. H. Kordes' father's greenhouse in Elmshorn, Germany, the middle of April, and it was just coming into bloom then and had been dormant nearly all Winter. Probably there is too much Pernetiana blood in it to make it a Winter forcer.

The rose that captured the Foreign Gold Medal this year was Howard & Smith H. T. rose, No. 252; and Pernet-Ducher's *Souvenir de Georges Pernet* the French Gold Medal. Howard & Smith's rose, No. 252, is pronounced Indian yellow color. The outer petals fade out some. It is a good size rose, full, very double, shape when more than one-half open not quite as pleasing as when in bud or full open, a good grower, splendid foliage, good stems and a rose that attracted the judges immediately and well worthy of the Gold Medal.

Pernet-Ducher's H. T. rose, *Souvenir de Georges Pernet*, named after his second son whom he lost in the War, large, well formed, fairly dark pink, a very promising rose, good free grower. I do not think it has quite the possibilities as a garden rose as *Claudius Pernet*, although a very splendid pink rose it is. Both these roses of Pernet-Ducher are in a class by themselves.

Each year, four certificates are awarded; three for H. T.'s and one for climbing or Polyantha rose. The first certificate was awarded to Pernet-Ducher's rose, *Etoile de Feu*, which scored 9½ points, very similar in color to *Herriott*. I should think it was an improvement as to growth and size of flower, but not so striking in color.

The second certificate was awarded to a Hybrid Tea seedling of Chambard, *Huguette Vincent*, with a dark green foliage, carrying on an erect stalk a big flower, half double, with very large petals, the color carmine. The quality of this rose is its strength, the foliage, the rigidity of the stalk, the striking color of its flower, and the rich and constant blooming of same; scoring nine points.

The third certificate was awarded to Leender's H. T. *Aspirant Marcel Rouver*, one of the parentages being Sunburst and the other unknown. This to my mind seemed like the best rose of the three that were awarded certificates. Apparently a free, easy grower, very similar in shape to Mrs. Aaron Ward, flowers much the same color, possibly a shade lighter, much larger and longer bud, and to me it looked like a good forcing rose. If it proved to be a better rose than Ward as a greenhouse rose from a grower's standpoint, it would certainly be a very valuable acquisition for the commercial man and would fill a gap which is badly needed in America, that of a yellow rose. It impressed me probably far more than any of the rest of the judges and the reason for this was the others were not looking at it so much from the forcing standpoint as I was.

The fourth certificate, unfortunately was not awarded as there was nothing in either climbers or polyanthas that seemed to be worthy of this certificate.

Among the H. T. roses that were scored was *Cornelius Timmermans* one of Timmermans', a shade much like the old Carnot, but quite a little darker, a very attractive flower indeed. Probably a good garden rose, but not so much of a forcer, although could not tell. This variety scored 8 points, a 1920-1921 rose.

Rev. Williamson, a 1921-1922 rose, moderate flower, red flowering, a shrimp pink color, good form, rather promising, scored 6 points.

Venus, 1921-1922, a coppery apricot. This variety did not appear at it best, the Dicksons saying that they had seen it in very much better shape.

No. 308, a seedling of Looymans, 1921-1922, had a wonderful new and brilliant color. One would probably describe it as a bright flame cerise, very vivid, nothing very much outside of its color, and that was really very distinct. A number of others showed up fairly well, but nothing more that one would call promising.

Clarice Goodacre, *Admiral Ward*, *F. Bidet Raymond* and *Madame Jules Bouche* showed up fine. These are older roses, not of last year's introduction.

Mr. W. E. Wallace spoke of *Ethel Somerset*, a H. T. pink in color that he thought would be a good forcing rose, one of Alexander Dickson's and also *Mrs. Wemyss Quin* was a very promising yellow that might fill a gap for an American yellow forcer. This is an English rose, one of Alexander Dickson and Sons'.

In the climbers, *Paul's Scarlet Climber* stood out in the garden by far the best among the climbers, and they said that it had been

in bloom for over two weeks and was still in fine shape and attracted the public probably more than any other one rose in the Gardens. There were several plants of Paul's Scarlet Climber and one group of four plants trained up in pyramid shape made a wonderful show. This is rather an attractive way to train climbers, especially where they are as free bloomers as Paul's Scarlet Climber, which presented almost a solid, vivid red mass. *Aimile Nerine*, one of Nonin's seedlings, much on the order of *Excelsa* but light in color and comes into bloom much earlier, was very attractive and looked like a promising climber. The public admired it very much.

M. Cherious, chief counsel of Paris, president of the third committee of the Conseil Municipal (avenues and parks), was elected president. There are two committees for the Conseil Municipal in Paris, which take care of the competition in new roses, the third committee, under whose care are the avenues and gardens and the fourth committee of the Conseil Municipal that cares for the fine arts.

The Rev. Mr. Pemberton, of England, was elected vice-president, representing the English, and Samuel S. Pennock, vice-president, representing America. The minutes of last year's meeting were read and approved, and then the awards of the Gold Medals and Certificates were made, each award being voted upon separately.

Among the jurors were quite a number of Paris officials, among them M. Le Corbellier, who used to be president of the Conseil Municipal of Paris; M. Lealier, president of the police court; M. Deville, president of the Fourth Committee of the Conseil Municipal; M. Autrand, president of the Dcpartement Seine; M. Aucoc, syndicus of the Conseil Municipal of Paris; M. Malherbe, general director for the work in Paris; M. Garnier, administrative director of architecture and avenues; M. Bois, professor of the museum for natural history and also a prominent botanist.

After our counsel meeting, we adjourned to the Chateau de Madrid, where we enjoyed a very splendid, well-served luncheon amid delightful surroundings. M. Forestier was very much in evidence as really the one who was directing everything: our deliberations in the field, at the counsel and also at the luncheon. He is very efficient, thoroughly knows roses, is a splendid gentleman to meet and it is an honor to be numbered as one of his friends.

Altogether this day was a wonderful experience for me, meeting a most delightful number of men, and it was certainly a great honor to be numbered among them,—an experience I hope and trust I will be able to repeat again at some future time. They had a few speeches, not very many, and short. We were welcomed by the president, M. Cherious, and both Mr. Pemberton and myself were asked to say a few words, which we were glad to do. I extended an invitation to any one who could come and join the American Rose Society on their pilgrimage to the Northwest in 1922. They are very anxious that the American Rose Society have a representation each year at the Bagatelle Gardens, two representatives if possible.

BEWARE OF THE BEAUTIFUL NATIVE

WHEN we meet with some beautiful native plant, there is always the temptation to introduce it to the garden. One only finds out when it is too late that it is not always safe to do this, for though there are some desirable plants that either do not over-encroach or are easily repressed, such as the Water Forget-me-not, there are others that respond only too readily to the more generous conditions of the garden and run riot and become actual pests. One of the first to beware of is the handsome *Equisetum telmateia*, the Great Horse-tail; it

is only safe to plant it in some damp place, well away from the garden, or it will become a pest that is hardly possible to get rid of. In a moment of incredible folly I once brought home a root of the Common Field Horsetail (*E. arvense*). It interested me because it is not common in my district and it was a long time since I had seen it. It was laid in for further examination, forgotten for a time and then revenged itself for neglect by rooting and spreading over a choice corner of ground where hardy plants are propagated by sowing. In this case the un-wisdom was inexcusable because the plant has no particular beauty. It was an unlucky day when I brought home the handsome great yellow Loosetrife (*Lysimachia vulgaris*); in its wild home by the river side it was only in small patches and looked as if it would not spread unduly, but its introduction has proved a misfortune that I have never ceased to regret; for not only does it run at the root, but even if prevented from seeding it has mysterious ways of appearing in unexpected places and is almost impossible to eradicate. The common Tansy, so handsome in large masses by the water side, is another garden pest, though it is easier to get rid of than the Loosetrife.

Some specially fine wild forms of Field Scabious (*Knautia arvensis*) could not be resisted; the best for size and color were marked with stumps and dug up in the Autumn, giving rise to another lifelong regret. They root deeply and seem to come up all the more persistently for having been, as we thought, thoroughly dug up and abolished. Another regrettable indiscretion was the introduction of Enchanter's Nightshade (*Circœa lutetiana*); not a showy thing, but with a modest prettiness, and perhaps all the more attractive from its romantic name and because it grows in quiet, shady, mysterious places, that in themselves have an alluring quality. The pretty Wood Sorrel should also be avoided as it covers and smothers everything, but nothing is so bad as *Campanula rapunculoides*, with its pretty spike of purple bloom. Goutweed (*Egopodium podagraria*) is bad enough and baffles most people, though if it were not for its bad qualities, the sheet of comely green leaves would, in some cases be an acceptable ground covering. But I have succeeded in abolishing it here and there by persistent rooting up, and it is an honest enemy for which one has some regard, for the roots are white and can be seen and then it has rather a pleasant smell. But there is no good word to be said for *Campanula rapunculoides*; it is an enemy of the worst type—insidious, treacherous—all that is mean and odious. I read in Johns' "Flowers of the Field" that it is a very rare species. I wish it were rare in my garden!—GERTRUDE JEKYLL in *Garden*.

None of the above-named plants are native to this country but the *Equisetum* and *Circœa lutetiana*. I don't think anyone would consider seriously introducing either into a regular garden. *Campanula rapunculoides* is a common "escape" along roadsides and, as Miss Jekyll says, it is both "mean and odious," though not without a certain grace and beauty. One native, used generally in hardy borders, that is a rapidly spreading pest, is *Physostegia virginica*, the false dragon's head, or "obedient plant." The alien purple loosestrife, *Lythrum roscum*, is also frequently planted in gardens with disastrous results. This stately importation from the old world has taken possession of the marshes along the Hudson during the past twenty-five years and is now spreading over the uplands, to the despair of the farmers and estate owners. Its rosy magenta spikes are very striking in masses and at a distance, but it should be kept at a distance, or it will supplant everything else within reach.—EDITOR.

Training Gardeners in the Public Schools

OTIS M. EASTMAN

“THE public schools of America are facing the problem of furnishing professional gardeners to fill the vacancy caused by the late war which cut off the supply of trained men who came from Europe.” This was the challenge thrown out by the National Gardener’s Convention in Cleveland in 1919.

What the Cleveland school system has to show in answer to this challenge is the subject of this paper. At the time of its mention in the convention the idea of the schools furnishing trained horticulturists was met by the statement that school training is not practical; that apprenticeship, which gives the young man in training real experiences in commercial greenhouses and gardens and real business contacts, is the only practical training possible. What Cleveland is doing may largely be attributed to the 1919 convention, because it was from that meeting that the broader vision of school gardening came.

It is, perhaps, a justified impression that public school courses in general are impractical. It is erroneous, nevertheless, to say that public school courses are necessarily so. The work in Cleveland is as real as it is in the commercial houses, and at the same time, its cultural values are enhanced because of its reality.

What is school gardening? Before answering that question directly let me say that, in Cleveland, school gardening covers Nature-Study in the first six grades and elementary horticulture from grade seven through the senior high school.

A school garden is an outdoor laboratory in which a child has an opportunity to get wholesome experience, something out of books, a chance to act upon his book knowledge, an opportunity to get content for expression; above all, a chance for an American sort of Education.

The garden furnishes an opportunity to study Nature “near to life”; a chance for the boys and girls to acquire a taste for cultivating plants and solving problems connected with them; a chance to study real objects by doing things, making with hands and tools as well as minds; all of which should lead to familiar acquaintance with the important natural objects of the environment, and to observation of relationships, to knowledge of plant growth, to recognition of friends and foes among insects and birds, and some understanding of weather and climate.

The school garden, carried out as it is from the first grade through high school, develops the latent genius in the child, so that during the course of years in the work there is a gradual weeding out process. This means that the senior year in high school will find the classes in horticulture made up of boys who have chosen the work with a definite end in view, that of devoting their lives to the profession of gardening. All this is possible for one reason: the boys are given the chance to find themselves in the early days of their school life, at a time when the appeal of growing plants will find a home in their minds; and as they go through high school they will elect courses to suit their desires.

The enrollment in Cleveland courses has increased over 500 per cent since 1919, when the work was put upon the present basis. This increase is due to the fact that the nature of our course has been changed to meet the needs set forth in the Cleveland convention. Students are trained now upon the basis of “doing” rather than “hearing.” They perform, during their course of instruction, over 100 operations, which include actual business

experiences in selling upon the market and buying supplies and material, and figuring out their gardens upon a labor-cost basis.

(A list of these operations is appended.)

The sharp line between agriculture and horticulture is clearly drawn here. Agriculture pure and simple is a subject of remote interest to boys and girls who seldom so much as visit a farm. It is physically impossible for them to have the practice in farm work which should accompany such training. Of the 130,000 students in Cleveland public schools only a negligible handful in outlying districts live on farms. Gardening, on the other hand, may be profitably pursued by the city dweller; his children can find interest and enjoyment in it; they may study it as a science for which the laboratory is provided in their own back yard.

Agricultural teaching has been on trial in cities for some years, but it has never reached more than a small number of students, and the expense of installing and maintaining laboratories has been almost prohibitive. In most city schools the enrollment has dwindled in recent years. The class at West Technical High School began with sixty members and dropped to four or five. Several school boards have taken the step of substituting gardening in its place, as has been done in the one case here.

A new greenhouse is to be constructed at West Technical High School. The plant, to cost \$60,000, is to be equipped thoroughly and divided into six compartments, and in addition a palm house for tropical plants, a storage cellar, and a work house large enough to accommodate a large class. The building of this plant, together with the plans being prepared for three others in different sections of the city, may be attributed to the vision which came from the Cleveland convention.

In our present greenhouse at West Technical High School we have been hampered by lack of space and inability to regulate temperature. In the new plant we will be able to raise roses, carnations, sweet peas and other flowers because we will be able to regulate temperature suitable for them. Vegetable crops,—such as lettuce, cucumbers, and tomatoes, heretofore an impossibility, will be possible.

The storage cellar will simplify the caring for roots, bulbs and seeds. The work-room will allow room for our growing classes and the propagation house will relieve the congested benches we use today. The number of plant varieties in our nurseries and gardens has increased from thirty-one to more than seven hundred. This number will double in another twelve months.

It is a point of interest to note here that the school gardens set aside one fifth of their total acreage for nurseries. Work on these nurseries is done in part by skilled adult labor, but mostly by boys who have taken proper technical courses in plant propagation. The department pays the boys by the hour according to their ages and training. The workers are faced with the actual problem of making the nursery pay. The income from the nurseries offsets all costs in maintaining them. This is an incentive which appeals strongly to the boys, several of whom have put themselves through high school and have entered college with money earned in extra hours and during vacations.

Perhaps the chief effect upon the Cleveland system has been the expansion of the department of school garden-

ing from a purely extension project to one whose roots are reaching into the regular school curriculum. The department is now running upon a three-part basis: Nature-study in the first six grades, elementary horticulture in seventh and eighth grades and senior high school, with the garden as an out-of-door laboratory furnishing the ground for actual experiences and real observation. The school garden furnishes the "content" material.

It is through this organization that the rapid growth of the school gardens has begun in Cleveland. This, of course, is starting in the right direction, when one bears in mind that there is a demand for trained horticulturists. The whole scheme, however, makes necessary a fourth department in which teachers must be trained for the work of teaching.

At present we are training teachers for the gardens as we go. For training teachers of nature-study in the first six grades, courses are given in Cleveland School of Education during the Summer. The securing of the technically trained teacher is our present problem, and we have plans for teacher-training which we hope will be recognized by the state. A model four-year course of study is being prepared by the department which, it is anticipated, will provide the highest type of training possible in horticulture and will be recognized by the leading universities in the country. Courses of study already in existence have been worked over with the definite purpose in mind of proposing a four-year course which will prepare the teacher for work in city schools. It is estimated that a half dozen of these teachers can be used in Cleveland each year as they are graduated from the colleges giving the horticulture training, and as the work progresses, Cleveland work will also expand to meet a steadily increasing supply while other cities will, in time, require an increasing number.

So far I have dealt with facts concerning what we are doing as a result of the National Gardeners' Convention in Cleveland in 1919. There is a great deal more to be said about school gardening,—its philosophy, its practical and cultural values. By way of summary, I have arranged these values, as briefly as possible, in outline form.

PRACTICAL VALUES

(a) School gardening fosters habits of industry in the boys and girls.

(b) Children with home or school gardens, under guidance of teachers, learn the real value of home produce. The problem of securing sufficient and better food is the greatest economic problem in the United States.

(c) School gardening is a lesson in home economics; children see advantages of having fresh vegetables and flowers instead of having to buy their produce on the market.

(d) Children in school gardens show parents that their child can do more than they had expected. This gains a sympathetic attitude of parents for the school system in general.

(e) School gardening affords teachers an opportunity to know better the individual child.

(f) A chance to bring other school subjects into play is afforded in the different phases of gardening.

(g) For those who see the attractiveness of learning while they earn, school gardening offers extra-hour employment. Money earned in this way has been applied by many Cleveland school boys to their higher education.

(h) Real experience is the keynote of school gardening. In the technical high school the boys perform a series of over a hundred operations, the same as those performed in the commercial house. It is an important factor that this real experience is to be found in a public school. It must be remembered that the greenhouse, the nursery, the home plot, the tract plot—all are real business concerns in that they sell their produce. Skillful labor is necessary and easily obtained when the pupil has a financial interest.

(i) Children's minds are open to the possibilities of making profit. This phase may be considered as the linking factor standing between practical and cultural values. The possibilities of profit induce the careless boy or girl to become as skillful as he or she can.

CULTURAL VALUES

(a) Perhaps the greatest cultural value is the fact that the child educates himself. Nature offers an exceedingly attractive field for any child, with its out-of-doors, its freedom, its beauty. It is no problem to obtain good educational results when the course of study attracts the pupil—

1. Through the stimulating inducements of prizes, profits, and the spirit of competition, the child acquires as much technical knowledge as he possibly can. At the same time he is acquiring an—

(b) Appreciation for Nature. This comes to him through developing his powers of observation.

(c) An appreciation of natural phenomena engenders a wider basis of understanding. The place of the child in his environment, his adaptation to the life about him, his relation to other forms of Nature, including other individuals, all tend toward—

(d) A better social realization. His contact with others, bent on a common enterprise, will reveal to him the inter-dependence of individuals for social well-being.

(e) Confidence to attempt the new things before him with an open mind is an important cultural advantage. The boy or girl gains this confidence in gardening because he is allowed to measure his own capabilities through doing things for himself.

(f) The whole scheme builds responsibility in the child. Responsibility is a quality highly desired in children, but many phases of school activities fail to develop it, due, perhaps, to the unreality of their subject matter, and the lack of opportunity offered for leadership among boys and girls.

WHAT CONSTITUTES A FRUIT?

THE question has been going the rounds of the amateur and trade horticultural press for many years, and every once in a while it comes up anew, which of the products of our kitchen gardens are fruits and which vegetables, and the battle generally rages around the tomato. One says, "The tomato is a vegetable, it is not a fruit, fruits grow on bushes and trees," and then he complacently takes his seat. Another says, "A tomato is a fruit, because it looks like a fruit," and rests his case there, and a third says, "It has been settled long ago that a tomato is both a fruit and a vegetable."

Abraham Lincoln once said, "Nothing is ever settled in this world until it is settled right."

In New York City in 1915 a Judge of one of the City Courts settled the question as far as the tomato is concerned, and settled it right. A woman was arrested and brought before him for selling "vegetables," in such a way, or at such a time as to violate a city ordinance. She was selling tomatoes, and in her defence contended that a tomato was a fruit, not a vegetable, and the Judge ruled in her favor and discharged her, quoting as the basis of his decision from Joseph Y. Bergen's "Foundations of Botany." The passage quoted was essentially as follows: "A fruit is the ripened ovary of a flowering plant with its contents and whatever parts are consolidated or intimately connected with it."

A few illustrations may help elucidate this statement. A tomato, egg plant, squash, pumpkin, cucumber, apple, peach, orange, and the like, and also wheat, rye, peas, and beans and the like are all fruits, because they are the ripened ovaries of flowering plants, with their contents and whatever parts are consolidated or intimately connected with them. An ovary is that part of the pistil of a flower which contains the seed.

On the other hand the edible roots of the turnip, beet, onion, carrot and the edible foliage of celery, parsley, mint, lettuce, cabbage, spinach and the like are vegetables, not fruits.

You have a shilling. I have a shilling. We swap. You have my shilling and I have yours. We are no better off. But suppose you have an idea and I have an idea. We swap. Now you have two ideas and I have two ideas. We have increased our stock of ideas 100 per cent.—A. S. Gregg.

WAR AGAINST BILLBOARDS

JUDGING by the various reports in the New York newspapers, the National Association of Gardeners convention held in this city made it fairly evident that even the "Say it with Flowers" sign is arousing the ire of lovers of a natural landscape. W. N. Craig, president of the association, declared they were utterly opposed to unsightly signboards of every description, and it was their intention to wage war upon such disfigurements, especially those of the Society of American Florists urging people to "Say it with Flowers." The florists, he said, should be the last people to lend their support to a movement which is ruining the landscape.

The hostility against roadside signs will surely have to be taken cognizance of for while vast numbers of people have no autos, and therefore see little of the signs, and while many who do possess them, have no more regard for scenery than they have for other people's rights and property, there are, nevertheless many who do feel that commercialism as generated by the advertising man, is an outrage and needs curbing lest he develop it to a point of desecration.

Of course, the bulk of the signs would never be possible but for the revenue they yield to land owners; they no doubt reap a better harvest from a few boards than they would from a field of Corn.

The *Evening World* editorially puts forward a suggestion which florists might well consider. It is an indication that the press is not specially in sympathy with signs, but has a regard for florists and gardeners. If the two groups can settle the difficulty satisfactorily, other industries must look after their own affairs. We believe the billboard on country roads is doomed; what may happen in the cities no one can foretell. We know that in some quarters, signs, overhead wires, and similar disfigurements of town thoroughfares are being cleared.

Maybe the idea of the city and country beautiful can be overdone; we know the law can be directed almost as any determined section of people may desire. If the sign haters enlist the aid of the press they will win.—*Florists' Exchange*.

WHY NOT FLORAL BILLBOARDS?

THE following is how the *Evening World* views the question:

"The members of the National Association of Gardeners beautify landscapes. They tend the gardens of big estates of wealthy citizens.

"Naturally they hate to have their efforts thwarted by unsightly billboard nuisances along the main traveled ways. If they can devise any practical means of banishing billboards, they will enlist the aid of Nature-lovers everywhere.

"In particular, the gardeners have a real grievance against their natural allies, the florists. 'Say it with Flowers' is the slogan of the Florists' Association. But the florists have been 'saying it with billboards,' an atrocious contradiction.

"Surely the florists ought to take the suggestion and enlist the aid of the gardeners to help them 'say it with flowers.' A beautiful arrangement of foliage plants to spell out their slogan on a few hillsides would have more advertising value than hundreds of billboards. People would motor out of their way to see such a display. Why not? Maybe it would be a lesson to other advertisers to say it with flowers instead of with billboards."

"Impatience has prevented many a fellow from taking firm root in the soil of success. Don't expect to reap the moment you sow."

ROADWAY SIGNS

UNDER the above caption the *New York Post* recently published the following letter. Publicity of this kind will, sooner or later, have effect. The florists' trade may do well to consider how far its own advertising efforts may antagonize public opinion and meet the case accordingly.—*Florists' Exchange*.

TALL OAKS FROM LITTLE ACORNS GROW

Sir: The stand taken by the National Association of Gardeners against the commercial advertisements scattered over the countryside deserves wide comment, for it permits the hope to rise that its protest may gather force enough from a like minded public to end this thoughtless spoliation. We have resigned ourselves to receiving advice from housetop and billboard when we go shopping in the city or are on pleasure bent at the theatre. But no one whose patriotism includes a feeling for his native soil can ride along the Boston Post Road to New Haven without a sense of shame that even a historic highway has been fairly hedged in with glaring and generally ugly signs.

When last year the Prince of Wales' brother suggested to the British Royal Academy that dignified sign posts were a legitimate field for their efforts we merely smiled over here at his audacity. Behind it, however, was a feeling for the English countryside far keener than anything we Americans commonly evidence for ours, and the fact that he referred not to advertisements (which have not been allowed), but to road directions, is an indication of how far we are from a proper jealousy to preserve our landscape from desecration. America, will never at this rate become a "garden land" even to the most delirious poet of patriotism.

I have been waiting for years to have somebody of national standing speak out as the gardeners have against this nuisance. Meantime, however, an interesting piece of legislation has been enacted in Vermont which seems to point the way to a cure. Largely as a matter of revenue for a relatively poor State, the proceeds to go to improving the roads, Vermont has required that a license shall be secured for every roadway advertisement larger than an ordinary placard, the minimum rate, as I recall it, being \$10 a year. Indirectly the law will tend to achieve the greater object of ridding the country roads of objectionable advertisements. The criticism that it might "hurt business," moreover, comes at a time when we have, I hope, passed the peak of the advertising craze, and the chances are still fair that our age may leave to the historian of 2021 evidences of our concern with something besides underwear, dyspepsia tablets, and chewing gum.

MERRILL F. CLARKE.

Genius gets the world's praise because its work is a tangible product, to be bought, or to be had for nothing. It bribes the common voice to praise it by presents of speeches, poems, statues, pictures, or whatever it can please with. Character evolves its best products for home consumption; but, mind you, it takes a deal more to feed a family for thirty years than to make a holiday feast for our neighbors once or twice.—*Holmes*.

A CHRISTMAS GIFT

We all appreciate practical gifts, so why not give your friend a subscription to the GARDENERS' CHRONICLE for Christmas? \$2.00 a year.

The Chronicle Press, Inc., 286 Fifth Ave., New York, N.Y.

A Lesson on Winter Protection for Hardy Plants

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

THE above caption may possibly be considered paradoxical as the question can rightly be asked, How can a plant be considered hardy if it needs Winter protection?

Plants growing wild are always naturally protected during the Winter, in other words, Nature always mulches, and we can learn another lesson in this connection from Nature inasmuch as she mulches her plants all the year round.

If we go to any part of Nature's garden we shall find all the debris of the season's growth in the form of the flower-stalks of herbs, their leaves, and those of shrubs and trees, etc., remaining year after year. This debris holds snow for a longer period than does bare ground; its decay year after year continually adds a covering of light, porous material over the crowns and roots of the plants which not only affords food, but through which air and moisture readily penetrates, and which also prevents moisture evaporating from below and retards the entrance of frost from above. In an artificial garden neatness must of course be in existence, but in this connection it is possible to exemplify the proverb that "Excess of virtue becomes a vice." The viciousness of the craze for ultratidiness is more conspicuous with some kinds of hardy plants than with others, and many kinds have to struggle for existence and are sometimes killed outright because of the entirely unnatural conditions surrounding them; to these plants we shall make special reference later. But this much may now be said that when you allow the vigor and health of a plant to become impaired on account of neatness, you certainly pay much too high a price.

As in the majority of cases we may not be able to carry out Nature's method entirely of allowing the annual debris to remain year after year, we have to use artificial means for Winter protection.

There is another feature in connection with safeguarding plants, especially evergreens, from severe and prolonged frost, which has to be thought of in some seasons, namely, to see that the soil around their roots is moist before the ground freezes; this obviously has to be taken into consideration actively before such things as mulching.

Probably few can remember a year in which this point is of greater importance than the present one in which the total rainfall has been much below the average, and when, as at the time of writing, the soil and the subsoil are practically dried out. Under the present soil conditions a prolonged period of wet weather will be necessary, even if every drop penetrates the soil, to wet the ground to the depth of many plants' roots. If evergreen trees and shrubs are allowed to go into Winter under the prevailing soil conditions there will undoubtedly be some very serious losses in districts where frost penetrates the soil to any depth. Under these conditions protection can be afforded by thoroughly soaking the soil to the depth of the lowest roots, anything short of this will be of little use. Even in the rare cases where the soil around plants is in a proper condition, a considerable amount of rain will be required to saturate the soil more than a few inches, whereas the roots of many things are a couple of feet below the surface. It is therefore safer to disregard rain altogether the present season.

While the evaporation of moisture from deciduous plants after the leaf has fallen is small compared with that from evergreens, there is no doubt a certain amount of moisture lost through the tentacles of their bark, and it would be beneficial to thoroughly water deciduous trees and shrubs, especially those which have been planted during the current year. It must be borne in mind that evaporation from plants in Winter is greater during severe frost than under warmer conditions, and evergreens especially require this resulting loss to be made good, as plants of this character are never strictly dormant; as a matter of fact in no living plant, deciduous or otherwise, are life's processes entirely suspended. If the soil and subsoil are allowed to remain in their present absolutely dry condition, there is nowhere from whence this loss of moisture can be made good.

Loosening the soil around plants facilitates the entrance of water and also does much to prevent subsequent evaporation of moisture from the ground. Hard ground is at all seasons the greatest hindrance to a plant's health and soil should be loosened if possible as wide as the branches extend. When the soil is loose water can penetrate, but when the surface is hard the bulk of

water applied, whether by rain or artificially, will flow away before it can be absorbed. With the subsoil in the present dry condition making holes two feet deep with a crow-bar will greatly assist the water penetrating; these holes should be at more frequent intervals in a heavy soil than in a sandy one.

In applying water merely holding a hose in one's hand and watering the surface for a minute or so at a place is really waste of time. A sprinkler should be used and be kept going at one spot for twenty-four hours. In adopting this method in connection with clumps of Rhododendrons, for instance, which are too wide for the water from a sprinkler to reach the entire clump, a tripod with a flat board on the top sufficiently high to be above the tops of the plant can easily be rigged up, the sprinkler wired to it and placed in the middle of the clump; this may be readily moved from place to place as required.

After being sure that the soil around the roots is thoroughly wet, mulching is then in order, although the actual placing of mulch in position is better left until there has been sufficient frost to encrust the surface of the ground. Mulching to any depth before really cold weather induces mice and other rodents to take up their quarters in it and they sometimes damage the bark of plants.

We have said that Nature mulches, and the material which gives the natural mulching remains to decay and cause such soil conditions in woods and other natural plantings as to practically secure a mulch all the year round. While it is not perhaps practicable to adhere to Nature's methods in every case, with Rhododendrons and allied subjects complete success can only be obtained by strictly following Nature's ways regarding them. Only a few weeks ago a woman who is enthusiastically remodeling an old garden which has been neglected for many years, said that it was not worth while to use Rhododendrons as all she had seen in the gardens of her friends and elsewhere were in a bad and unsightly condition. It was explained that this state of things was not the fault of the Rhododendrons, but was brought about by neglect and bad treatment. Properly planted and cared for these plants and others requiring similar conditions will flourish in full sun as well as in positions more or less shady. But the fact is that it is rare to find these subjects planted or treated properly owing sometimes to the ignorance of the quack gardener employed and sometimes to the ignorance of the employer who refuses to permit a gardener who knows how to do things in the correct way.

Those who know all about the natural conditions under which members of the *Ericacea* family, to which Rhododendrons belong, live and thrive have no reason to wonder at the results of the absolutely unnatural methods meted out to them in many gardens. We see the ground between them continually raked and not a leaf allowed to remain on the ground at any time of the year; however dry the weather they are never watered and the soil around them becomes hard and close, exactly the opposite to the soil conditions under Nature's treatment. It is no matter for surprise that after a few years of unnatural treatment they gradually die out and at least have all the time a sickly, ugly appearance. If in addition the initial planting was wrong then they become sick and die, all the sooner.

After Rhododendrons have been planted under as nearly as possible their natural soil conditions and watered sufficiently to thoroughly saturate their balls, they should be mulched with six inches of leaves. These leaves should *never be removed*. At the beginning of every succeeding Winter another six inches of leaves should be applied, first being sure that the roots are moist. This process will gradually accumulate a continually increasing layer of leaf-mold on the surface into which the roots of the plants will spread, keeping them cool and moist all the time, and the plants will also thrive on account of the food supplied by the decayed leaves.

All evergreens, trees, and shrubs are greatly benefited by a Winter mulch, either of manure, a mixture of manure and leaves, or of the latter only. This mulching not only prevents the frost from going so deeply into the soil: prevents the too early starting of growth in the Spring to be sometimes cut back by wintery weather in March, but affords food as well.

For the hardy perennial border a mixture of stable manure and leaves is suitable, and in using this mixture for all purposes it is well to mix them together in a heap first and let them stand

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Departments of Foreign Exchange and Book Reviews

IRISES BY THE WATERSIDE

THROUGHOUT the floral world it would appear that Nature, in her wonderful economy, gives more freely those of her works that have attained the highest perfection. Having achieved a superior type, she multiplies it with slight variations in such a way that it can never fail in its appeal to beauty-loving mankind. It is as though she says, "Here is one of my best works, I will place it in many parts of the world so that it shall not be overlooked. High up in the mountain fastnesses, down in the green valleys, in the dry wilderness, and lush, low-lying meadow lands. I will vary its constitution and construction to suit all these conditions, and moreover will so arrange the organs of assimilation that there shall be species that will thrive under all the varying conditions of the geological development of the earth. Some shall live and grow where water is scarce, and only moistens the roots for a few months in the year. Others shall trust themselves out into the margins of the still waters, and there display their beauty, twice enjoyed, once in the actual flower, and again in the wonderful reflection cast into the depths at their feet."

All and more than this has she done with the *Iris*. Perhaps no other genus exhibits in such marked degree so pronounced an accommodation to every environment. From the *Oncocyclus* and *Regelia* groups that love to be sun-scorched and baked during the resting period, to the species *Pseudo-acorus* that will thrust its growth right into the waterway, there exists an immense range of forms that require every varying phase of intermediate condition. Again, the whole world of vegetation can be broadly divided into three groups—lime loving, lime hating, and lime indifferent. In the genus *Iris* we find all three represented. Thus at one end of the scale we find the rhizomatous Irises, which, almost without exception, demand lime in the soil for healthy survival. These include the beautiful section known as the Bearded frises of June. At the other end of the scale are the California species and *Iris Kämpferi* which object to lime. Thus every possible condition is provided for, and a fact equally remarkable is that, with very few exceptions, all can be classed as hardy in the temperate zones of the world.

In recent issues of *The Garden* the value of the Bearded Irises has been fully emphasized. It is the turn now of the species and varieties that revel in moist conditions and are suitable for planting in low-lying land where the moisture is permanent, and by the side of lake, pond or stream. Most of these are grassy leaved and exceedingly attractive on account of their foliage.

Among them none is more exquisitely beautiful than the truly regal Japanese *Iris Kämpferi*. Incidentally, the Japanese have given us an excellent example in the naming of the many varieties of this beautiful flower, and one could wish that their poetic instincts entered into the naming of some of our home-bred productions. *Shiratski* (White Waterfall) is infinitely more suggestive of a silvery white flower with broad fluted petals than is Mrs. Pocksted-Clak which is the sort of name that our English raisers love to bestow on their choicest hybrids.* One sees also in *Hatsushimo* the glistening sheen of "First Frost" suggested on the white petals. In *Mamijino-taki* (Maple Waterfall) the splash and swirl of tumbling waters, dyed with the reflected colors of crimson purple from the overhanging Maple is prettily conveyed. Then there are Moonlight Waves, Yezo Embroidery, Morning Mists, Distant Mountain and others, and so the characteristics of the beautiful flowers are associated with some other beauty of Nature or art, and thus speak to the imagination. Mrs. Pocksted-Clak may be a beautiful production of Nature or art, or both, but there is little to suggest it in the name, which takes the imagination nowhere beyond the flower that bears it. Distant Mountain and Purple Isles give us at once two pictures. One in the flower itself, another in the grey blue of ascending hills in the far landscape, or visions of the lake scenery of Killarney, Corrib, or a placid sea where in the sunset glow an archipelago of islets rise darkly on the horizon.

Iris Kämpferi are strong feeders. They make a very large number of fibrous roots, and therefore the soil in which they are planted must be well prepared and rich. Moreover, for the same reason the best results are obtained by transplanting about every three years. They love plenty of water during the growing season, but are not at other times so insistent in respect of water as they are generally supposed to be. They succeed by the

waterside, but should be planted just above the water level. They will do in any well cultivated border, providing they are given plenty of water from March to the middle or end of June. After this period the normal conditions of an English Summer suit them admirably. They are best transplanted during September or October, or during suitable weather in March or April. No plants should be introduced by the waterside during mid-Winter.

Next to the *Kämpferi* I think the Siberian Irises rank, both for use and beauty, as waterside plantings. The best varieties are Emperor, a deep rich purple; Perry's Blue, an exquisite shade of turquoise blue with deeper veining; and Snow Queen, a pure white. It is impossible to enumerate all the species and varieties that can be used under the conditions described, but there are some that are indispensable. *I. Delacayii* is a Chinese species with rich dark violet flowers and graceful foliage. *I. Cuprea (fulva)* I have seen reaching out from the bank right into a narrow stream and apparently enjoying itself immensely. It is a curiously beautiful shade of reddish copper. *Albo-purpurea* and its greatly improved form, *Colchesterense*, will stand partial submersion during the Summer months. Then there are the varieties of the native *Fatidissima*, the golden foliage of which is invaluable by the waterside and in shallow water. The species itself is likely to become a little too rampant for any but the largest areas. *Pseudo-acorus foliis variegatis* is an indispensable variety of the species said to be the origin of the fleur-de-lis, the "golden Lilies of France." I believe there is no really satisfactory authentication of this claim. There is a story that Louis VII, during one of the Crusades, was retreating from the Saracens, and this *Iris* indicated shallow water across a river. By fording it at this point he and his followers escaped, and he therefore introduced the conventional symbol into the Royal Arms of France. I believe, however, that the fleur-de-lis appeared much earlier in Venetian heraldry. Moreover, the fleur-de-lis was introduced into the English arms by Eleanor, the divorced wife of the same Louis, when she married Henry II. I do not know whether, in heraldry, the divorced wife claims to carry with her the quarterings of the husband, but it seems at least probable, in this case, that Eleanor claimed the fleur-de-lis in her own right, as she would scarcely be ambitious to wear a symbol adopted by Louis if it had been created by him during their brief association. The facts certainly cast a doubt on the veracity of the statement, and, personally, I incline to the belief that the flowers became fleur-de-lis (or flower de luce) on account of their resemblance to the heraldic symbol, rather than that the flower was the origin. One could suggest several quite as probable origins that have nothing to do with flowers.

Other Irises that flourish by the waterside, though not necessarily at its edge, are: *Aurea*, a golden giant; *Ochroleuca*, a noble plant, both as regards foliage and its ivory white flowers; *Monnieri*, a pale yellow of luxuriant habit and profuse flower; *Spuria*, rich dark blue; and their hybrid forms, such as *Monspur*, *Monmaurea* and others. Then there are also the species *Bulleyana*, *Forresti*, *Lavigata*, and other Chinese and Japanese forms.

Gold and purple, violet, rose, lavender, grey blue, ivory white and many intermediate shades and tones are the materials offered by these denizens of moist lands to paint our waterside pictures. Foliage unequalled for elegance and grace is theirs, which makes them valuable in such positions even though they never bore a flower.

The *Iris* is an enthusiast's flower. The old-time race of flower fanciers of florists is gradually dying out, and their place is being taken by flower lovers who admire color and form with a taste which becomes every year more precise and exacting. Who admire them, moreover, in the individual specimen as did the florist of a generation ago, but, unlike him, if the proportion and coloring be beautiful, they care not a jot whether or no the flower attains some arbitrary show-bench standard of form. Their warmest approval, however, is, in general, bestowed on the gracious effects which such flowers as these Irises produce when boldly massed by still water.

In the pure still light of the early morning, when every green sword and form of flower is reproduced with sharp precision in the waters beneath; during the ever-varying light of a Summer's day when, with each passing cloud, the iridescent flowers take on new and subtle shades; in lightly stirring breeze, when the eventide atmosphere grows cooler as the sun sinks lower, and a gentle zephyr ripples the face of the waters, and the reflections become blurred and indistinct in a kaleidoscopic wash, one longs

*Would our catalogs not be improved by abandoning altogether the cumbersome Japanese names and by substituting English translations?—Editor.

for the art of all the masters to catch the fleeting visions of beauty that the waterside Irises provide. And yet it is better that there is no realism in art that can fix their transient glories. Just because it is not so, because each day and hour produce some new but evanescent color delight peculiar to the texture and color of the Iris, they are the more desirable to a beauty-loving mankind to whom variety is movement and life; fixity, stagnation and death.—*The Garden* (British).

THE VALUE AND USE OF LEAVES AS MANURE

MORE attention will have to be paid to the question of using vegetable manure during the coming Winter than has ever been paid to it before. Stable manure is offered by factors at fabulous rates, and the price at stables is very little less; to this has to be added a very considerable amount for cartage, so that in some districts the cost per load works out at about a pound. Whatever may be said to the contrary, stable manure is assuredly not worth twenty shillings a ton. Gardeners should use it as little as possible and turn their attention to vegetable manure.

Leaf-mold is one of the first materials that one thinks of when searching for a suitable substitute for stable manure, but leaf-mold is, in itself, not rich enough to replace stable manure as an active fertilizing agent. It can, however, by treatment, be improved so much as to be a most efficient substitute, and there follow methods for carrying this out.

Oak and Beech leaves are undoubtedly best for the manufacture of first-class leaf-mold; but, except in certain districts, there are not nearly enough of these leaves to make the quantity of mold that will be required. Other leaves have therefore to be used; but, rather than run risks of ruining what might be valuable manure by mixing in unsuitable kinds, it is well to destroy on the garden bonfire all acid leaves, such as those from Conifers and Poplars. Papery leaves, such as those of the Plane, which come to the ground in the late Summer, should also not be incorporated, as they are so tough that they will take many months to rot.

The usual way of making leaf-mold is, as all experienced gardeners are aware, to let the leaves rot in a heap or pit for eleven or twelve months, turning them over occasionally so that all the leaves may become uniformly decomposed. This treatment makes admirable humus for incorporating in potting soils. If such leaves are to be of much use for digging in during the late Winter and early Spring, a more expeditious method must be employed. Experiments last season showed that two methods of treatment give excellent results, and as the matter is of the greatest importance to gardeners, both are outlined below.

The first method involves the use of half-rotted vegetable refuse, Cabbage leaves, seed-free weeds, grass clippings and so forth. A hole is got out, sufficient to hold at least three-quarters of the material that will be required, and a thick layer of half-rotted vegetable refuse its first thrown in. The leaves as collected are shot into the hole, a few cans of water in which a little superphosphate of lime is dissolved being thrown over them. If the leaves are collected in very wet weather, which is advisable, as they then do not blow about so much, it is unnecessary to water them. In this case a little dry superphosphate should be scattered over them to increase their manurial value, and at the same time to hasten to some small extent their decomposition. Having put in leaves to depth of about 10 inches, the mass should be trodden down as firm as possible. It will be found that they will shrink by at least one-half. It is then advisable immediately to cover them up with a further supply of half-rotted vegetable refuse, making this moderately firm. The process is repeated as necessary until all the available leaves have been collected. A thick layer of half-rotted vegetable refuse, or, failing that, soil, is then thrown over the mound.

A large hole is now, by means of a wooden pole, bored in the top of the mound, and into this is tipped all liquid manure that can be spared. Strong house slops can be pressed into service should the supply of liquid manure from the farm or the gardener's liquid manure barrel be exhausted. Further soakings should be given at frequent intervals, and it will be found that in a little time the whole pile will begin to ferment, and will be quite warm when the hand is put down the bore-hole. In a very few weeks the whole mass will have become rich in valuable humus, and by Christmas the heap can be taken to pieces, the outer parts being thoroughly mixed with the rest and dug in without further treatment.

It sometimes happens that such an abundant supply of vegetable refuse is not available for the making of leaves into humus. It goes without saying that if they are mixed with stable manure their decomposition will be greatly hastened, and the manure will go a great deal further. The second method, however, involves neither the use of vegetable refuse nor of stable manure. This method is based on the fact that artificial fermentation can be induced by the application of heat to wet vegetation. The garden

bonfire will be in full swing throughout the Autumn and Winter for destroying any forms of vegetable refuse which are too hard to rot. There is a great deal of waste heat which might well be utilized, and this can be turned to advantage for the speedy conversion of leaves into humus. In the first place, if it is impossible to collect the leaves in wet weather, they must be given a thorough soaking of plain water. It should be noted that it is quite unnecessary, and indeed, wasteful, to soak them for this purpose with liquid manure, as if this be done much of the food content of the liquid manure would be wasted. The garden bonfire should be coaxed until it is a mass of red-hot ashes, and upon this should be quickly piled a large quantity of the soaked leaves. Instantly the outer redness of the fire will vanish, and such heat will be evolved as will make the material sweat right through. This sweating makes the material commence to decompose, and while a small proportion of it is certain to be charred, comparatively little waste of humus is involved. Do not let the fire burn through it though, otherwise its value for humus will be practically nil. Preferably it should be dug in while it is still sweating, and a little dissolved bones or superphosphate may be scattered over it along the open trenches.—*The Garden* (British).

SUGAR AS A PRESERVATIVE FOR BORDEAUX MIXTURE

AT the annual meeting of the Massachusetts State Vegetable Growers' Association, held at the Experiment Station, Lexington, Mass., U. S. A., it was demonstrated that sugar used in combination with Bordeaux mixture will indefinitely preserve the latter. It is stated that a teaspoonful of granulated sugar is sufficient for the preparation of 50 gallons of a 4-4-50 Bordeaux mixture, equal to one-eighth ounce of sugar for every pound of copper sulphate used. The teaspoonful of sugar is dissolved in one quart of water and the solution is added to the 50 gallons of water used in preparing the Bordeaux mixture; an excessive amount of sugar causes the copper to dissolve. As ordinary Bordeaux mixture loses its effectiveness if not used within a very short time after being prepared, the use of this small amount of sugar will, it is claimed, save much waste of the fungicide, for with its use the mixture can be kept an indefinite time at its full effectiveness.—*The Gardeners' Chronicle* (British).

THE RIGHT JUDGMENT IN PLANTING DAFFODILS

WHERE it is proposed to plant Daffodils in a large way, it is best to do it with some definite intention, rather than to sprinkle them about in haphazard fashion. Much damage as to good effect has been done in many places by quantities of bulbs being bought at sales and sent to the country place for the gardener to plant, without any special instructions. It is not the gardener's fault if the result is unworthy or even absurd, as in a known case where some thousands of Daffodils were planted round Oak trees in concentric rings, in an important region where garden ground joined on to park land.

What has been found to be the most effective way is to plant in a series of long shaped drifts, with a rather thicker nucleus. To set out the ground for planting a stick can be put at the end of each drift, or what is a still better guide, a garden line or thin rope laid down to define the edge. It is not meant that the bulbs should be in any sort of line against the rope, but only that the line of rope should confine the edge of the growth. The actual planting may be in groups of three or four bulbs anywhere within, with occasional single bulbs.

The general run of the groups may best be arranged so that the more obvious points of view are at a more or less right angle to the general axis of the whole group. It is surprising how good the effect of such planting is, especially in the late afternoon when the yellowing sunlight, striking on the successive lines of bloom, intensifies the color of the Daffodils and makes the whole into a most satisfactory picture of plant beauty.

Each large planting should be of one kind at a time, whether of yellow trumpets or of some good kind of *Incomparabilis* or hybrid. Where the soil is chalky, it will be well to make extensive plantings of the white *Poeticus*. It is a native of limestone alpine pastures and is never very happy in the light soil.—*The Garden*.

LONICERA STANDISHI AND L. FRAGRANTISSIMA

WITH these two Winter-flowering Honeysuckles a good deal of confusion exists, both names being often used indiscriminately; indeed, one is frequently quoted as a synonym of the other, though in reality they are separated by several well-marked characteristics. *L. Standishi* is of quite shrub-like habit, forming a somewhat erect growing bush, clothed with ovate-lanceolate leaves, hairy on both surfaces when young, but when mature almost smooth on the upper side, though beneath, the hairs are still retained. The foliage of this is deciduous. The flowers are white, borne during the Winter months, and are de-

liciously fragrant. Though it will cover a considerable space if trained to a wall, this Honeysuckle is, strictly speaking, simply a shrub, while, on the other hand, *Lonicera fragrantissima* is more or less of a climbing habit. Besides this it differs from the first-named in the leaves being broadly ovate, quite smooth on both surfaces, and retained on the plants to a greater or less extent throughout the Winter, so much so that unless in the case of very severe weather it can be regarded as an evergreen. This is also very fragrant. The specific name is derived from that circumstance, and it commences to flower soon after Christmas.—*Gardening Illustrated*.

DEPARTMENT OF BOOK REVIEWS

PAGES FROM A GARDEN NOTEBOOK, by Mrs. Francis King. Charles Scribner's Sons, New York.

Very entertaining, instructive and quickening are these carefully elaborated jottings from the notebook of one of the most cosmopolitan of gardeners. Suggestive though it may be of life in cities, this term, more fittingly perhaps than any other, characterizes the person who writes so understandingly of small back-yard gardens, of gardens in England and in Spanish America, of arboretums, as subjects by themselves and as the means of introducing desirable exotics, and of her sex in its relation to practical agriculture. This last-mentioned topic, adequately handled, with official authority, has now fortunately been put into readily accessible form as a chapter of this book. Another chapter of pre-eminence is entitled Bright-berried Growth for the Winter Garden. Still another especially commendable chapter is headed Summer Thoughts in Winter. In it particularly, as on various pages, is shown enthusiastic but at the same time judicious appreciation of many of the desirable improvements in varieties of newer trees and shrubs prized for their ornamental forms, flowers and fruits. That so many of these are enjoyed upon the author's own premises, in a northerly town of Michigan, is indication of the fact that it is ignorance or lack of a little study that deprives the most of the rest of us of the pleasant widening of our horticultural world.

With her exquisite color-sense, and with her happy faculty for thinking out effective combinations, Mrs. King has already been able to advise concerning the most artistic placing of not a few of these novelties in the plant realm of north-central America. Herein, as in her former books, lies the distinctive worth of this. It is not a handbook for the beginner. For him it may provide the zest for pursuing an ideal in that field so fruitful of human improvement, the field of "gardening finely."

A LESSON ON WINTER PROTECTION FOR HARDY PLANTS

(Continued from page 780)

for a few days, turning it over once or twice which will cause fermentation and kill many of the weed seeds the manure may contain. Never use stable manure containing wood shavings for any garden purpose. Another mulch which is by many thought well of is to spread the coarse stock-yard cattle manure between the plants and cover with salt hay or straw.

In certain cases special treatment is advisable with regard to covering up. Plants such as Sweet Williams, Pinks, Foxgloves, Hollyhocks and all others having evergreen foliage should never be covered with anything heavy that will hold moisture. In these cases it is better to cover the ground between the plants and leave their tops uncovered; or at the most use a light cover of straw or salt hay; pine boughs are also good for covering such like plants.

The comparatively little known but very desirable *Eremurus* should also have special treatment, which, having regard to the high merits of the plant is certainly worth while. Its characters may be described as magnificent and distinctive, but even where it is planted it is rare to see it well grown. It may have stalks eight feet tall with a flower spike four feet long which remains in flower for about a month. Want of success with it is doubtless sometimes caused by its being destroyed or weakened by the ignorant laborer. Its foliage dies away early, very soon after flowering, after the dead debris is cleared away the underground portion of the plant is liable to receive harm by cultivating the ground unless its position is permanently marked. In the Autumn it should be covered with a mound of coal ashes, and later on, after some frost, a box or harrel should be placed over it and filled with dry leaves, which receptacle should afterward have a water-proof cover. In its native home in the elevated and very dry region of Western Asia Spring starts in February and has no set-back. The plant here therefore starts at more or less the same period, and unless it is protected along the lines above suggested the early growth is invariably damaged or killed. This plant is one worth exercising patience and care over, as, unless

one is fortunate enough to obtain well-established clumps it may be several years before it blooms, and, when the conditions are right, the longer it stays in one place the greater the grandeur of its flowers.

Another plant which is not generally as permanently successful as it might be is the *Montbretia*, (to give its trade name but it is botanically *Tritonia*) and its dying out is often complained of. Sometimes the unskilled or jobbing gardener is to blame for it. If the dead stems and foliage of this bulbous plant are cleared away in the Fall there is nothing in the Spring to show that anything is planted at the spot unless it is securely marked, and if the ground is forked over in the Spring the small bulbs are turned out and unrecognized by the above individual. In many cases the treatment given this plant is to take up the bulbs in the Fall as is done with gladioli; but while the latter do not receive any harm from being dried, the *Montbretia* does, and it is generally best to keep the latter in boxes of moist, not wet, earth in a cool frost-proof place. We believe, however, that the *Montbretia* may be successfully wintered in the ground much farther north than is generally supposed, and the results would be found to be greatly superior to those of taking them up and replanting each year. Success in wintering *Montbretia* out of doors is more certain if we copy Nature by allowing all flower stems and foliage to remain until Spring. Cutting the latter off, and what is very much worse, pulling it off, causes rain to descend into the center of the bulbs and the result is that they are burst by frost and rot; the latter may also take place even without freezing. The bending over of the stems by the mulch does no harm. In this case as in that of all bulbs, the mulch should be thick enough to prevent frost from reaching them.

As roses are generally grown in a border by themselves they may have special treatment. Too often they are not in the first place planted deep enough, as if the junction of the rose proper with its stock is three inches below the surface of the ground it will have that much more additional protection from severe frost over and above those planted with the junction above the surface. In this connection it is better to have roses on their own roots rather than budded, and the combination of being deeply planted and upon their own roots renders the more tender hybrid teas capable of being safely planted much farther north than is usually considered advisable. For roses the manure used for mulching may be heavier and more rotted than that used for herbaceous perennials and it should be placed all over the ground around the roses not less than a foot thick, after allowing a few inches for settling. A mixture of leaves and manure may be used, or leaves entirely. When the latter are applied alone, wire netting a couple of feet high should be placed all around the roses not less than a foot or more from the outside plants and the space enclosed entirely filled with leaves.

Obviously gardens differ in their relation to the prevailing Winter winds. Some may have the protection of a wooded hill or windbreak of trees; part of a garden may be protected by the residence or other residences and buildings, and so on. Those who have been handling a particular garden for a number of years will be familiar with the necessity or otherwise of giving protection to the above ground portion of plants. Sometimes an evergreen growing in a wind-swept position will receive more or less damage when another of the same species growing a few yards away in a sheltered position will never be injured.

Along the sea coast protecting evergreens with boards is very necessary in positions facing the sea. There are many plants which will go through the severest Winters on the north side of a building that will be more or less damaged on the south side; this is due to the effect of the sun upon the frozen leaves.

The strawberry patch requires mulching, but while for Winter protection it is not necessary in warm localities, mulching between the plants always does good. When applying stable manure in the colder districts where the plants themselves are the better for being covered, it is well to shake out the heavier portion from the manure for use between the plants and use the strawy part over them. Where salt, or marsh-hay can be obtained it answers the purpose very well, as also do pine needles. The latter have the advantage of not holding much moisture, and are very clean and free from weed seeds. By leaving the mulch over the plants until somewhat late in the Spring, flowering is delayed and by this means damage to the blossoms by late Spring frosts may be sometimes avoided.

All other berries and bush fruits should have their roots mulched with manure. In the more northern districts red and white raspberries are more fruitful if their canes are protected with corn stalks or anything answering the purpose; some people bend the canes over and cover them with earth first, and straw, leaves, etc., on top.

Quite apart from the question of giving protection from actual cold, mulched plants will always give better results the following year in growth, flowers and fruit, all other things being equal, than will those to which it has not been applied. In many cases

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National Association of Gardeners

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LOCAL BRANCHES

Newport, R. I.: Andrew L. Dorward, chairman; Frederic Carter, secretary.

St. Louis, Mo.: George H. Pring, chairman; L. P. Jensen, secretary.

Nassau County, L. I.: John T. Everitt, Glen Cove, chairman; John McCulloch, Oyster Bay, L. I., secretary.

NEW ENGLAND CONFERENCE, NOVEMBER 30

A New England conference under the Boston and vicinity members of the National Association of Gardeners will be held at Horticultural Hall, Boston, November 30, at seven o'clock, to discuss the problems pertaining to the profession and the formation of a local branch, and to make preliminary arrangements for the 1922 convention which is to be held in Boston. All interested in ornamental horticulture are cordially invited to attend.

WESTCHESTER CO., N. Y., BRANCH

Notices will be mailed shortly to all members living in the vicinity of Westchester County to attend a meeting at White Plains, to be called for the purpose of organizing a branch of the association in that territory.

ACKNOWLEDGMENT OF COOPERATION

The New York convention committee takes this opportunity to express its appreciation to the following members of the trade: Bobbink & Atkins; Burnett Brothers; Carter's Tested Seeds, Inc.;

Davey Tree Expert Co.; Lord & Burnham Co.; Joseph Manda Co.; W. E. Marshall & Co., Inc.; W. F. McCord Co.; A. L. Miller; Muller-Sealey Co., Inc.; F. R. Pierson; Julius Roehrs Co.; John Scheepers, Inc.; Stumpp & Walter Co.; Charles H. Totty Co.; Andrew Wilson, Inc. Also to the local societies who contributed: Nassau County Hort. Society; Oyster Bay Hort. Society; Tarrytown Hort. Society; Tuxedo Hort. Society, and Westchester & Fairfield County Hort. Society.

ALEXANDER MICHIE, Chairman.

NEW SUSTAINING MEMBERS

Henry F. Schwarz, Greenwich, Conn. (John R. Jackson, gardener), E. Dimon Bird, Greenwich, Conn. (August Harter, gardener), have become sustaining members of the association.

NEW MEMBERS

Alfred Reoch, Westbury, Long Island, N. Y.; George Tansey, Great Barrington, Mass.; James C. Foster, Woburn, Mass.; George Rust, Barrington, R. I.; Robert Clyne, Port Washington, Long Island, N. Y.; Louis D. Aquila, Akron, Ohio; William J. McLaughlan, Scarborough, N. Y.; Charles Davis, Port Washington, Long Island, N. Y.; Louis Schroeder, Grand City, N. Y.

AMONG THE GARDENERS

Robert De Schryver, for many years superintendent of the Swift Estate, Prides Crossing, Mass., accepted the position of superintendent on the E. D. Speck Estate, Detroit, Mich.

Charles Manson has succeeded James Warr as superintendent of Wildwood Farm, Seal Harbor, Me. Mr. Warr sailed on the *Olympic* for a six months' stay in England.

James A. Reburn resigned his position this past Summer as general manager of Fernbrook Farm, Mt. Kisco, N. Y., and has accepted a similar position on the William Church Osborn Estate, Graymoor Farm, Garrison, N. Y.

William C. Dickson has accepted the position of gardener to Capt. Emerson, Lutherville, Md.

Peter Morrison secured the position of gardener to Hamilton Kean, Elberon, N. J.

Carl Bausch accepted the position of gardener on the Mrs. Charles Kohler Estate, Suffern, N. Y.

Gustav Hamerlin secured the position of gardener on the B. Clarkson Estate, Tyringham, Mass.

Frederick Crawford has accepted the position of gardener to Mr. Menke, Hill Top Farm, Hartsdale, N. Y.

A. Fournier, who recently resigned his position as superintendent of the Paul D. Cravath Estate, has accepted a similar position on the Bradley-Martin Estate, Westbury, L. I.

Carl Peterson secured the position of superintendent on the Henri Bendle Estate, Great Neck, L. I.

Robert Marshall succeeded A. E. Thatcher, who has sailed for England, as superintendent of Planting Fields, the estate of W. R. Cce, Oyster Bay, L. I.

C. H. Halpin has accepted the position of gardener on Miss H. L. Maynard's estate, Ridgefield, Conn.

Richard Calvert of Chestnut Hill, Mass., has accepted the position of superintendent on the Aldrich estate, Glen Cove, L. I.

A LESSON ON WINTER PROTECTION FOR HANDY PLANTS

(Continued from page 783)

the value of mulching is by reason of its preventing the frequent changing from frost to thaw from lifting shallow-rooted plants out of the soil and not for its protection against severe cold. Again there are some species that are never harmed by the coldest Winters which die out more or less in warm, wet ones. This is especially the case with those classed as Alpines. In their native habitat they are always mulched with a covering of dry snow which remains until it goes for good in the Spring. These plants should be protected from Winter rain more than anything else and for this purpose are frequently covered with a sheet of glass, after placing coarse sand around them so that their collars, or junction of leaves with crown, have no stagnant moisture around them.

LOCAL SOCIETIES

LENOX HORT. SOCIETY

The annual Fall show of the society was held in the Lenox Town Hall, October 20 and 21. The most striking features of the show were the splendidly grown collection of orchids exhibited by A. N. Cooley, Esq., and most tastily arranged by President Oliver Lines. This collection caused a great deal of comment by not only our local people but by the visitors from New York, Boston and New Jersey, and it was spoken of as the very best exhibit ever put up by a private gardener in America, and no doubt would be hard to surpass by any collection across the pond. The judges, Edwin Jenkins, Thomas Page, and Harold H. Bryant, awarded the above a Gold Medal, this being the first time in the history of the Lenox Horticultural Society a gold medal has been awarded to any exhibit. Another feature of the show was a collection of splendidly arranged foliage plants, arranged and exhibited by Frederick Heeremans, head gardener at Elm Court, the country estate of Mr. and Mrs. Henry White. The exhibit covered the entire west side of the hall and was so artistically arranged that a silver cup was awarded the same. Since our last Fall show the members' wives have been elected to honorary membership and our meetings are graced with their presence and our show was made attractive by an added feature of their skill in canning. A splendid exhibit of fruits, vegetables and meats was put in competition and received the admiration of the lady visitors. There were twenty classes tastefully arranged, and the chief winners were Mrs. Oliver Lines, Mrs. J. Johnson, Mrs. F. Kirkham, Mrs. A. J. Loveless, Mrs. Robert Scott, Mrs. Robert Rose, Mrs. Doncot. The managers were A. J. Loveless and Robert Scott.

F. KIRKHAM, Asst. Secy.

WESTCHESTER AND FAIRFIELD HORT. SOCIETY

The above society met October 11th in the Red Men's Hall, Lewis Street, Greenwich. All members should notice that the date of the meeting has been changed from the second Friday of the month to the second Tuesday; also that we no longer meet in Hubbard's Hall.

Vice-president James Tough occupied the chair and although many members were attending the convention of the National Association of Gardeners, we had a very fair attendance. The New Rochelle Hospital was the beneficiary of over \$4,000 from our recent exhibition in that city, a fact that pleases John H. Troy and his show committee, and also one that the whole membership ought to be proud of.

One minute's silence was asked during the meeting as a token of esteem for our friend, W. Ashley, landscape architect, of Mount Vernon, who spoke before this society a short time ago. Mr. Ashley was a true lover of Nature, a splendid orator, and a man that was respected by every one whom he came in contact with.

GEO. HEWITT, Cor. Secy.

TUXEDO HORT. SOCIETY.

The annual exhibition of this society was held in the ballroom of the Tuxedo Club on November 4 and 5 and was quite up to the display of former years. The exhibits from the J. J. Blair place, D. S. Miller, gardener; the H. M. Tilford place, Joseph Tansey, gardener; D. Wagstaff place, Thomas Lyons, gardener; also the George

F. Baker, Col. F. B. Keech, G. G. Mason, C. B. Alexander, Mrs. J. M. Mitchell, Richard Delafield estates, were all of a high class.

R. H. Schaeffer was given the society's silver medal for an exhibit of new seedling anemone chrysanthemums. Charles H. Totty Co., of Madison, N. J., received a certificate of merit for their new white rose Angeleus. They also had a fine display of single and pompom chrysanthemums.

Group of miscellaneous plants, 1st, Joseph Tansey; group of chrysanthemum plants, 1st, Joseph Tansey, 2nd, Thomas Lyons; group of ferns, 1st, William Ellings, 2nd, Thomas Lyon; 6 ornamental foliage plants, 1st, Joseph Tansey, 2nd, Thomas Lyons; 3 Winter flowering begonias, 1st, D. S. Miller, 2nd, Joseph Tansey; table of foliage plants, 1st, Thomas Lyons, 2nd, Joseph Tansey; table of orchid plants, 1st, Joseph Tansey, 2nd, William Ellings.

Twelve blooms chrysanthemums, distinct varieties, 1st, D. S. Miller; 6 varieties, 1st, William Hastings; 6 yellow, 1st, D. S. Miller, 2nd, Joseph Tansey; 6 white, 1st, D. S. Miller, 2nd, Joseph Tansey; 6 bronze, 1st, D. S. Miller, 2nd, Joseph Tansey; 6 pink, 1st, Joseph Tansey. Eighteen pink roses, 1st, D. S. Miller; 18 white roses, 1st, D. S. Miller, 2nd, D. MacGregor; 18 yellow, 1st, D. S. Miller, 2nd, Joseph Tansey; 18 red, 1st, Joseph Tansey, 2nd, D. MacGregor; 18 any other color, 1st, D. S. Miller; vase of 25 roses, 1st, D. MacGregor, 2nd, D. S. Miller. Eighteen white carnations, 1st, Joseph Tansey; 18 red, 1st, Joseph Tansey; 18 light pink, 1st, Joseph Tansey, 2nd, D. S. Miller; 18 dark pink, 1st, Joseph Tansey; 18 varigated, 1st, D. S. Miller; 12 white carnations, 1st, Thomas Lyons, 2nd, William Ellings; 12 red, 1st, Thomas Lyons, 2nd, William Ellings; 12 light pink, 1st, William Ward, 2nd, Thomas Lyons; 12 dark pink, 1st, Thomas Lyons, 2nd, William Ward.

The displays of fruits and vegetables were excellent. The different classes were well contested. The judges were, Messrs. Sealey, Craham, and Strachan.

J. DAVIDSON, Secretary.

TARRYTOWN HORT. SOCIETY

The twenty-third annual floral exhibition of the Tarrytown Horticultural Society was held in Music Hall on November 2nd to 4th. The hall was turned into a bower of flowers, the boxes being decorated with Southern Smilax.

On the stage was located the plant exhibit of William B. Thompson, and in the rear of the hall was the fine exhibit of John D. Rockefeller. In the front of the hall was the very decorative exhibit of F. R. Pierson of Roses, Chrysanthemums and Ferns which, together with the plants on the stage and the very beautiful exhibits in the hall, made it one of the finest exhibits that has ever been given by the society. The quality of the exhibits was unsurpassed. While the show is not large, the quality is of the very best. There was not a poor exhibit in the hall from the vegetables up to the finest grown Chrysanthemums and decorative plants. Westchester County and those living on the East banks of the Hudson should certainly feel proud and congratulated upon getting so fine an exhibit. The attendance was very large.

In addition to the regular exhibits which follow, Certificates of Merit were awarded to the exhibit of F. R. Pierson, to a vase of Pompom Chrysanthemums from A. N. Pierson, Inc., Cromwell, Conn., and to the new Rose Priscilla. Special prize was awarded to William B. Thompson for an exhibit of twenty distinct Chrysanthemums. Honorable Mention was awarded to H. L. Van

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CUT FLOWER BOXES
EDWARDS FOLDING BOX CO
MANUFACTURERS
PHILADELPHIA, PA.

Praag for an exhibit of Pansies, and to H. E. Rogers for a plate of Quinces, and to Scott Bros. for their exhibit of Chrysanthemums. Finley J. Shepard exhibited a very fine plant of Banana in fruit, also Ginger, Cinnamon and Coffee plants, etc., which attracted a great deal of attention, and was awarded Certificate of Merit.

Six silver cups were awarded as well as over six hundred dollars in cash prizes to those who exhibited. The Tarrytown exhibition is known to be an exhibition from private estates.

The competition was so keen that the judges had difficulty in making the awards. The judges were as follows: First day, Robert Spiers, John F. Johnston and Robert Williamson; second day, William Brock, William Morrow and Charles Davidson.

Here and There

RESTORING THE GARDEN WITH ANNUALS

Happily this year provides a definite turning point in the affairs of the flower garden. There are not wanting signs of a great restoration. It is safe to prophesy that this year will be specially noted for the revival in the cultivation of annuals. It becomes the duty of every home owner to make the garden as pleasant as it can well be made, and there is nothing to equal annual flowers to restore the garden to its full glory in the shortest space of time.

Certain annuals are indispensable. Foremost among them is the Shirley Poppy. Then there are Asters, Stocks, Clarkias, Cornflowers, *Corcopsis*, *Eschscholtzias* (better known as Californian Poppies), *Gypsophilas* and *Phlox Drummondii*, to mention only a few, for there are many others, including Sweet Peas. There are well known flowers not strictly annuals that might well be included here, viz., Antirrhinums, or Snapdragons, Aquilegias and Wallflowers, all of which are best grown from seed. Certain annuals, once they are introduced into a garden, never fail to put in an appearance each year. We have in mind Pot Marigolds, now so very popular in Scottish gardens, Candytuft and the ubiquitous Nasturtiums. One of the charms of flower gardening is that it grows upon one, but the novice must be cautioned about the over-anxiety to get the seeds into the ground early. Annuals are often sown too soon in the open, and the result is premature blooming and a poor display.

Whatever the weather may be does not interfere with the sowing of seeds under glass. They can be sown in pots, pans or boxes; a very convenient size box is 14 inches long, 9 inches wide and 3 inches deep. The box must be well drained with crocks and rough leaf-soil. A suitable compost for sowing consists of two parts of loamy soil and one of leaf-mold, with one part of coarse sand. Pass this through a fine mesh sieve, leaving the rough stuff remaining in the sieve for putting in the bottom of the box for drainage. Fill the box lightly with soil, then press down moderately firm with a flat board. With many seeds it is a great advantage to sow under glass, afterwards pricking off the seedlings and transplanting outside. Antirrhinums are best grown this way, the simplest course being to treat them as half-hardy annuals, pricking off the seedlings into pans or boxes and then planting out after the Wallflowers and other Spring bedders have been removed. The tall varieties are very beautiful for mixed borders, but for general bedding pur-

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poses the intermediate section is the most striking, and at the same time the flowers are of great value for cutting. Larkspurs are among the most popular of all blue flowers. They are perfectly hardy, and the fine spikes of bloom are most graceful for room decoration, while very delightful effects can be obtained by putting these annuals in beds by themselves.—*Exchange*.

WINTER WINDOW BOXES

What looks so forlorn as an empty window box. Perhaps it has been gay with petunias, geraniums or some other flowers all through the summer months. But when these blooms have been cut down by the autumn frosts it becomes a bare and cheerless object. Need it remain so through the winter? By no means. There is no reason why it shouldn't be just as handsome throughout the winter season as in the summer, although in a different way. The solution lies in the use of evergreens. But to be successful with them it is necessary to have boxes that can be taken into the house at intervals or else to have the little evergreens stand in pots in the boxes.

Naturally, there is excessive evaporation from evergreens occupying such a position. This must be compensated for in some way. If the plants can be taken into the house once a month and given a thorough soaking with water they will go through the winter in perfect condition, and be ready to set in the ground when spring comes. If the little trees are in pots it is best to set them in a pail of water or in the bath tub and leave them for several hours until the air has been driven out of the earth and the soil saturated with moisture. If large pots are used, water should also be applied to the top. This same practice, obviously, is required for larger trees which are kept in tubs or in pots on the porch or at the entrance of the house during the Winter.

There are no better plants to use for outside boxes or tubs than the Blue Spruce, the White Spruce, Engelmann's Spruce, Arborvitae and Ground Junipers. Arborvitae is especially desirable for houses which are built of cement, stucco or stone, as they give mass without formal lines. Their winter coloring, however, is bronze or purplish green which, while pleasing to many people with artistic tastes, is not liked by everybody.

Increasing interest is being shown in evergreens as house decorations, and this extends even to the Christmas tree. In many homes the living Christmas tree is now preferred to any other kind. It is bought early in the fall, kept growing through the winter, and given a favored location in the garden when the spring comes.—*Horticulture*.

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Madison Cooper, Publisher, Calcium N. Y.

COLLEGE; WORKSHOP OR PLAY-GROUND?

President Charles A. Richmond of Union College is distinctly right in his statement that the college should be a workshop, and that the young man who begins his career on the campus should not expect an easier time than one who takes a job in a factory or in an office. "The idea that in coming to college a boy is postponing his life work for four years while he floats down the stream of time untroubled by the hard realities that other young men of his age have to face is not at all our idea of what a college means," he says. "Neither is a college a kind of intellectual incubator where young fledglings are hatched out with no effort of their own."

The problem which faces the universities is to make their undergraduates realize that their work is not only a preparation for life but life itself; that the study of mathematics or Greek or history, that the difficulties they overcome, that what they accomplish is just as vital to them as will be their life "out in the world." Every instructor knows how hard it is to convince the student that lectures and classes and examinations are not a mere round of calisthenic exercises.

President Richmond does a distinct service, then, in pointing out that the college must be a beehive of industry. As he says, the picture of a college where the long hours were passed agreeably under the shade of the classic elms smoking pipes and singing college songs has a certain attraction to the retrospective imagination of the graduate, but the entering freshman must realize that there lie before him years of hard, earnest endeavor, that he is not preparing for life but is participating in it, that he has entered a workshop, not a playground.—New York Sun.

THORBURN SALE

Sealed bids were invited for the sale of the firm of J. M. Thorburn & Co., and through these, the control of the business has passed into the hands of Carter's Tested Seeds, Inc., they having taken possession October 19th. The Seedsmen of America and Europe will feel a sense of sincere gratification that the work accomplished and service rendered by the firm of Thorburn & Co. is to be carried on by another old-established and reliable firm, whose existence reaches back for 85 years.

"Grant Thorburn," founder of the Seed House of J. M. Thorburn of New York, was born in 1773 in Dalkeith, Scotland, and early came to New York to seek his fortune. He was engaged for a time in the manufacture of wrought nails, but later established himself in a small store in Nassau St., where he sold Tapes, Ribbons, Thimbles, Thread, Scissors, etc. Through the sale of these, he occasionally had inquiries from Ladies for plants and flowers, and it was through this continual demand that he, in 1805, began what was then the first seed store in New York. His trade grew, so that in 1806 he was obliged to issue a catalog containing seeds and plants. The publishing of this catalog led to more pretentious writings and the "Gardener's Calendar" was the outcome, the first edition being published in 1818.

"Grant Thorburn" was a prolific writer for the Current Press on a variety of topics under the *nom de plume* of "Laurie Plod." "Grant Thorburn" left a most interesting autobiography, which was published in New York in 1852. He died at New Haven, Conn., January 21st, 1863, at the age of ninety.

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ter's Tested Seeds, Inc., began business 85 years ago. He was the first seedman to guarantee the germination of seeds. This practice is still in operation but has the advantage of the much improved scientific and up-to-date methods now in use.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of Congress of August 24, 1912, of "Gardener's Chronicle of America," published monthly at New York, N. Y., for October 1, 1921.

State of New York } ss.
County of New York }
Before me, a notary public in and for the State and county aforesaid, personally appeared M. C. Ebel, who, having been duly sworn according to law, deposes and says that he is the editor of the "Gardener's Chronicle of America" and that the following is to the best of his knowledge and belief a true statement of the ownership, management (and, if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, managing editor, and business manager are: Publisher, The Chronicle Press, Inc., 286 Fifth Ave., New York, N. Y. Editor, M. C. Ebel, 286 Fifth Ave., New York. Managing Editor, M. C. Ebel, 286 Fifth Ave., New York. Business Manager, M. C. Ebel, 286 Fifth Ave., New York.

2. That the owners are (give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent, or more of the total amount of stock.)

The Chronicle Press, Inc., 286 Fifth Ave., New York, N. Y. M. C. Ebel, Summit, N. J. M. E. Burniston and J. A. Burniston, both of Summit, N. J. S. Warendorff, 325 Fifth Ave., N. Y. Chas. H. Totty, Madison, N. J. A. Bauer, Tuxedo Park, N. Y. J. Barnett, Sewickley, Pa.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent, or more of total amount of bonds, mortgages, or other securities, are: (If there are none, so state.) There are no bondholders, mortgagees or other security holders.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the owners, stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other persons, association, or corporation has any interest, direct or indirect, in the said stock, bonds, or other securities, than as so stated by him.

Sworn to and subscribed before me this 1st day of October, 1921.

[Seal] M. C. EBEL, Editor.
JOHN H. KALE,
(My commission expires March 30, 1922.)

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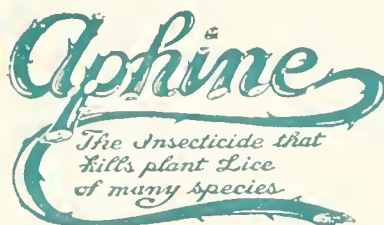
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To the readers of the GARDENERS' CHRONICLE



A Joyous Christmas
and A New Year of Peace,
Happiness and Prosperity



NOTICE

The Gardeners' Chronicle will be published promptly on the fifteenth of the month beginning with the January issue. Recent issues have been unavoidably delayed.

OF INTEREST TO COUNTRY ESTATE OWNERS

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M. C. Ebel, Secretary

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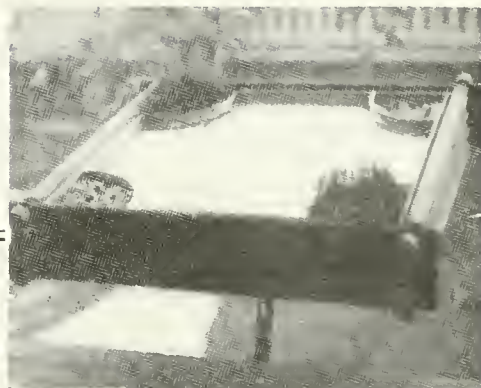
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(OF AMERICA)

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The Footpath To Peace

To be glad of life, because it gives you the chance to love and to work and to play and to look up at the stars; to be satisfied with your possessions, but not contented with yourself until you have made the best of them; to despise nothing in the world except falsehood and meanness, and to fear nothing except cowardice; to be governed by your admirations rather than by your disgusts; to covet nothing that is your neighbor's except his kindness of heart and gentleness of manners; to think seldom of your enemies, often of your friends, and every day of Christ; and to spend as much time as you can, with body and with spirit, in God's out-of-doors. These are little guideposts on the footpath to peace.—HENRY VAN DYKE.

Things and Thoughts of the Garden

MONTAGUE FREE

BY the time we had toured Warwick sufficiently, the day was well advanced, and it was too late to think of making the trip to Shakespeare's birthplace; so, acting upon a hint dropped by Mr. Smail, we decided to visit the public gardens of Royal Leamington Spa, distant about two miles. This town is a famous health resort, because of its saline springs, and as a result there is always a large visiting population. As usually happens under these conditions, the town authorities exert themselves to make the city as attractive as possible.

Upon reaching the town we found that the encomiums that had been showered upon its public gardens were entirely deserved. The park occupies an area of considerable extent along one bank of the river Leam, a tributary of the Avon. The opposite side of the river is taken up with private houses, with gardens stretching down to the river bank, adding greatly to the attractiveness of the park.

The most important features of Leamington's public gardens are to be found in the rather unorthodox bedding arrangements. There are possibly thirty beds, elliptical in shape, about twenty feet by eight, cut in the lawn on the circumference of a circle having a radius of about two hundred feet, with a band stand in the center. They differ from the usual formal garden beds in that they are occupied by a selection of hardy herbaceous perennials as well as the more usual half-hardy and tender bedding plants. There have been many advocates of this style of bedding, especially in England, who claim that it is equally as showy as the orthodox style, that it avoids the monotony inseparable from formal bedding, and is much less expensive. The results obtained at Leamington would indicate that there is a great deal of truth in these contentions, for at the time of our visit the beds were a blaze of color, and close inspection revealed the

fact that there had been a constant succession of flowers from early Spring onwards.

All of the beds were different and the material used was not planted in lines but in irregular groups. A list of the plants used in two of the beds will give a good idea of their general appearance.

In one bed were: *Cosmos* in variety, double perennial sunflowers, *Chrysanthemum maximum*, snapdragons, *Ageratum*, *Pentstemon*, stocks, *Erigeron* and *Tagetes*.

Another had: *Helenium autumnale*, tall perennial asters, snapdragons, *Papaver orientale*, *Delphinium*, *Galega*, dwarf *Tagetes* and *Oenothera*.

The more formal beds in another part of the garden were also quite striking; one in particular, which was made up of a ground work of ribbon and *Anthericum*, a border of pink geraniums with leaves variegated with brownish red, green, and yellow, and "dot" plants of standard *Abutilon* six feet high, interspersed with bush specimens of *Fuchsia* two and one half feet high.

Another striking bed was composed of a ground work of pink geraniums, a border of sweet alyssum, with "dot" plants of geranium four feet high, and between, fuchsias two and one half feet high.

* * *

The next excursion, using Cambridge as a base, was to the gardens of Earlham Hall, the estate of M. Sydney Morris, situated near Norwich in Norfolk.

Shortly after leaving Cambridge en route to Norwich, the Fen Country is encountered. This is a tract of land, supposed to be a silted up bay of the sea, of over 500,000 acres, which was formerly a marsh. It has now been drained and is used for agricultural purposes, producing fine crops of wheat and potatoes, and supporting much live stock. The various efforts to reclaim this area would make a romantic story for they were started by the

Romans and it was not until the beginning of the 19th century that reclamation was finally effected. The land here lies so low that it is necessary to maintain pumping stations to raise the water from the drainage ditches and discharge it into the rivers. Formerly windmills were used for this purpose, but nowadays steam furnishes the motive power for the pumps.

The soil of this region is almost entirely vegetable in origin and is in fact used as a fuel in the same way that turf is used in Ireland. We had ocular proof of its combustible qualities, for, in many places along the railroad, great holes, often twenty or more feet in diameter, had been burned in it. Owing to the extreme drought which was prevalent over the whole of the eastern part of England, these turf fires could easily be started by sparks from the railway engines. In a normal season, there is little danger of this kind in the Fen district, as there is usually a super-abundance of water. Indeed, it is reported that there have been occasions when the farmers have had to harvest their hay crop in boats!

On leaving Cambridgeshire one gets into an up-land region characterized by a sandy soil and scanty herbage, much of which consists of heather and various species of *Erica*. This section supports an immense population of rabbits, which can be seen by the hundreds from the windows of the railroad train if the journey is made in the late afternoon. So many were in view on the occasion of our trip that we mused upon the slaughter that would ensue if some of our Nimrodic gardening friends from America, with suitable armament, were given free rein in that district.

* * *

Our main reason for visiting Earham Hall was to see in bloom the collection of hybrid montbretias which have been raised in this garden, but on reaching the estate we found that these were far from being the only interesting things in evidence.

The Blue Garden, an area of perhaps one-half an acre enclosed with red brick walls, was wonderfully beautiful at the time of our visit. The main feature in this garden was made up of box bordered beds of *Perovskia atriplicifolia*. This semi-shrubby plant from Afghanistan and Western Tibet is eminently adapted for xerophytic conditions of existence as was amply proved by its thriftiness and vigor in the dry soil of this garden. It is a charming plant, with flowers of a delicate shade of lavender blue, which harmonizes well with the silvery tone of its foliage. It is moderately hardy and will survive the Winter in the vicinity of New York if planted in well drained sandy soil.

Other flowers that were making a fine display in this garden were: *Thalictrum dipterocarpum*, the blue meadow rue which is now fairly well known in this country, *Ceratostigma Willmottii*, a new species of leadwort closely allied to the well known *C. plumbaginoides*. *C. Willmottii*, however, differs from the last named in having paler blue flowers, and in blooming throughout the whole Summer. *Convolvulus mauritanicus*, a semi-trailer from the Mediterranean region, that is feared not to be quite hardy in our climate, was another interesting plant in this garden. *Delphinium* and *Aster amellus* were also used. Many tubs containing the African blue lily, *Agapanthus umbellatus*, were placed at important points and served admirably to break the flatness.

The Rose Garden is another feature at Earham Hall. This is a sunken garden, its outer boundaries formed by a terrace wall of stonework put together without the use of mortar, and suitably furnished with wall plants in great variety, which grow luxuriantly in the chinks between the stones. The walks are of red brick which time has mellowed to a pleasant shade, and between them and

the beds are strips of grass, which form a pleasing setting for the roses. These are planted in rather narrow beds which allow about three rows to each. Only one variety is planted in each bed.

On the terrace surrounding the Rose Garden is a broad herbaceous border, backed with trees, which contains a great variety of plants both of the well known and rare species.

The Rock Garden at Earham is most pleasingly laid out and here again there is a wealth of rare plants. There were some remarkable specimens of shrubby New Zealand Veronicas which would indicate that the Winters are not severe in this section of the country. One plant in particular of *Veronica cupressoides*, three or four feet in height, and as much in diameter, was especially worthy of admiration. It is very seldom that this species is found in gardens in England over one foot or so in height. About the Rock Garden, and serving to shut it off somewhat from the rest of the layout, was a fine collection of trees and shrubs. Incidentally one of the noteworthy things about English gardens in general, is the fact that so many estate owners are interested in cultivating rare plants and new introductions, and are not satisfied to worry along with a commonplace material.

* * *

At Earham a great deal of attention is concentrated on the production of new varieties of Montbretias. These are Iridaceous plants which are now included under *Tritonia* by the botanists, but which will always be recognized under the older name of *Montbretia* by the gardeners. Montbretias have long been a favorite in England, and to a limited extent in this country, both as garden plants, and as cut flowers, their culture being similar to that accorded to *Gladiolus*.

The kinds most generally grown in the old days were *M. Pottsii*, a species with yellow flowers tinged with red, about one inch in diameter, and *M. Crocosmaeflora*, an orange shaded form, with individual flowers two inches in diameter. It is a bi-generic hybrid between *M. Pottsii* and *Crocasmia aurea*.

The Earham Montbretias are a vast improvement on the old forms, in size and substance of flowers; many have individual blooms as much as five inches in diameter the number of flowers produced on an inflorescence, and in their great range of coloring.

The genealogy of these new hybrids is probably somewhat involved and perhaps no record has been kept of their parentage, but in all probability they were evolved from *M. Pottsii* and *M. Crocosmaeflora*. At Earham, improved varieties raised at Westwick House were used as a base for the production of their new hybrids.

The variety that Mr. Morris considers the best is "His Majesty," which received a First Class Certificate from the Royal Horticultural Society. This is a free flowering form with individual blooms five inches in diameter. The following description of its color is quoted from the *Gardeners' Chronicle*: "The center of the flower is colored yellow, and this shades into brilliant crimson scarlet, the latter color being distinct at the tips." This variety must have made a great hit for I have a letter from Mr. Morris stating that he put a prohibitive price of five guineas a bulb on "His Majesty" but was obliged to part with some of them even at that price!

Although this is evidently a fine variety, it did not make so much impression on us at the time of our visit as the one called "Queen Charlotte." This has a fine branching spike with many flowers, in color, yellow, ranging into orange red toward the tips of the petals.

Another good variety is "Queen Boadicea." This is notable for the roundness of the flower and the width of

(Continued on page 798)

Dogwood Trees and Shrubs

ARBORUM AMATOR

THE Dogwoods, or, as they are sometimes called, Cornels, which name we prefer because it is more euphonious, older, and given for a better reason, belong to the family *Cornaceae*, and the genus, *Cornus*, which comprises about forty well defined botanical species, many varieties of these species, and several hybrids. It is our purpose to mention only those which are generally considered most ornamental for landscape work.

The word, Cornel, is a translation of the Latin word *Cornus*, meaning a horn, and was given to this genus of trees and shrubs, because the wood, especially of the trees, is hard like a horn. The word Dogwood was given because a decoction of the bark of *Cornus sanguinea* was used in England to wash mangy dogs.

DOGWOOD OR CORNEL TREES

Of all the Dogwoods or Cornels which grow in tree form our native *Cornus florida*, Flowering Dogwood, is best known and most popular. This tree attains a height of twenty to thirty feet. Its hardiness, adaptability to almost any location, easy way of fitting in among other trees, deciduous or evergreen, floriferousness, large showy flowers (involucres), shining red berries, and beautiful orange-red Autumn foliage all recommend this as one of the best of our native ornamental flowering trees.

The impression that this is a difficult tree to transplant successfully is entirely erroneous, but it is true that it leaves out very slowly the first Summer after the Spring it is transplanted—early Spring transplanting is preferable to Autumn—and that sometimes, indeed it puts on almost no foliage until the second season. If, however, it is transplanted with care it usually lives.

This tree needs little pruning, as it generally grows in a pleasing form, but that little should be done directly after the blooming period because later pruning will destroy the flower buds which grow each Summer and Autumn for the next season's flowers.

What is commonly called the flower is really an involucre of four large white bracts sometimes tinged with pink. The real flowers which this handsome, showy involucre surrounds are small and inconspicuous, and grow in clusters.

Probably there are few trees the different parts of which can be used for as many purposes as *Cornus florida*. The wood of this tree is hard and heavy and hence good for forming into tool handles; the bark when mixed with sulphate of iron makes a good black ink; the bark contains the same elements as *Cinchona*, but in different proportions and furnishes a useful substitute for quinine, though not as effective; the twigs when chewed sometimes will ward off a fever; both the fresh twigs and bark make a good tooth powder when pulverized; a scarlet dye may be made from the bark of the roots. The beauty, however, of this tree, when in flower and fruit and Autumn foliage is its greatest asset.

THE VARIETIES OF *CORNUS FLORIDA*

There is a lovely pink-flowered variety of *Cornus florida*, which is called *Cornus florida rubra*. This variety which was first found in Virginia, and *florida*, the white species, when planted near each other, present a pleasing contrast and a beautiful sight when in full bloom in May. This pink-flowered variety does not always come true

from the seed, hence the nurserymen propagate it by budding it on *Cornus florida* seedlings.

There is also a double-flowered variety of *Cornus florida*, *Cornus florida flore pleno*, discovered and propagated by Mr. Van Lindley of North Carolina, a comparatively new and beautiful variety, a fit companion, as its flowers are white, for the species *florida* and contrasting pleasingly with the pink-flowered variety *rubra*.

Where a weeping tree is desirable the third variety of *florida*, namely *Cornus florida pendula* may be used effectively, especially since there are not many weeping trees which bear large, showy flowers. This variety was discovered by a Dr. Thompson in the woods near Baltimore, Maryland, and sold to Thomas Meehan, who propagated it and disseminated it. It is a noteworthy fact that all three varieties of *florida* came from the South.

There is another white-flowered species of dogwood, which comes from Japan, called *Cornus Kousa*. This closely resembles our native white-flowered *Cornus florida*, but blooms two weeks later, a characteristic which in itself makes this Japan species a desirable addition to our native species and varieties. The flowers (involucres) of this species are creamy white and sharper pointed than those of *florida* and begin to appear just after those of *florida* have fallen. This Japanese variety is entirely hardy as far north as Massachusetts and perhaps farther north.

DOGWOOD OR CORNEL SHRUBS

One of the most valuable of the Cornel shrubs is *Cornus mas*, whose common names are European Dogwood, English Dogwood, though it is not a native of England, and Cornelian Cherry. The flowers of this shrub, unlike those of *Cornus florida*, are small and yellow, but like them are borne in clusters from buds formed the previous season. The flowers appear in extremely large numbers in March or April. The berries which follow the flowers are the size of small plums, and bright red, for which reasons this shrub has received the name before mentioned, Cornelian Cherry. Tarts and preserves are made of this fruit by the European housewives.

Cornus brachypoda is a small tree or shrub. This is a native of Japan and central China, countries from which many of our most valuable shrubs have come. This is one of the handsomest of the Cornel shrubs, on account of its large panicles of white flowers and large foliage, but is not entirely hardy in the north.

RED-BARKED CORNEL SHRUBS

Several Cornel or Dogwood shrubs present a triple attraction for they bear not only pretty white flowers and berries but have red-barked twigs, the color being most brilliant usually in the Winter when it is most appreciated, and most easily seen since the shrub at that season is defoliated.

One of these red-twigged species is *Cornus alba*, which attains a height of about 10 feet. In Summer its white flowers appear in dense cymes, and are followed by white fruit, hence its specific name *alba*. During the Summer there is nothing particularly attractive about the bark but as soon as the leaves fall in Autumn, the bark put on a blood-red color which it maintains until it leaves out again the following Spring. This shrub is a native of

America. *Sibirica*, a variety of *alba*, has bright coral-red bark in Winter.

There is another native species of Cornel, a shrub about eight feet high, whose manner of growth is stoloniferous, from which characteristic it has been given its specific name, *stolonifera*. This shrub has white flowers with red disks, followed by white fruit. The bark on its slender branches is usually red in Winter.

Cornus sanguinea is a native of Europe. This attains a height of about twelve feet and bears dense cymes of greenish white flowers in June and has black fruit. The bark of its branches is purple or dark blood-red, but as a red-twigged species, though desirable for variety in Winter, it is inferior to our native species, *alba*.

We have another American species in the red-twigged division, namely, *Cornus Baileyi*. The Autumn color of the foliage and the Winter color of the red twigs of this species are extremely attractive. This handsome shrub of upright growth blooms nearly all Summer. It thrives in sandy soil.

VARIEGATED CORNELL SHRUBS

There are several varieties of the different species of Dogwood or Cornel shrubs which have variegated foliage. Among these are *Cornus alba argentco-marginata*, whose leaves are edged with white. *Cornus alba Spathi*, leaves broadly edged with yellow; *Cornus sanguinea variegata*, leaves variegated with yellowish white; *Cornus brachypoda variegata*, leaves edged with white.

Where variegated foliage shrubs are desired, these variegated cornels are all attractive, their characteristics aside from the variegation of the foliage being the same as the species to which they belong.

A CONSPECTUS OF THE DOGWOODS

Considered as a genus the Dogwood trees are valuable in landscape work, because of their large handsome flowers (involucres) bright red berries, and orange-red Autumn foliage; the Dogwood shrubs for their pretty, small, white flowers, red, white or black fruit and some species for their red twigs in Winter, and several varieties for their variegated foliage.

Arenaria—Sandwort

RICHARD ROTHE

BELONGING to the order *Caryophyllac* the genus *Arenaria* comprises a remarkable number of handsome garden species of highly ornamental merit. In the main, being hardy herbaceous inhabitants of the high altitudes of European mountain regions, their characteristics consist of a low creeping growth and a wonderful resistance of the dense verdure of a diminutive



Arenaria Montana

foliage. All the cultivated kinds have been, for the principal part, inmates of the rock gardens. Today the advanced class of American garden lovers more and more realizes that the only opportunity for enjoyment of a host of extremely attractive hardy flowering perennials is the rockery and to a lesser extent the dry-wall. Not the customary stone heap on the open lawn or in the shade of a tree-grove but the rock garden ascending along a natural slope or an embankment; the rockery in rugged but nevertheless artistic construction by its irregular pockets and nooks, by its boulder-strewn declivities, serving as a fitting receptacle for a wonderful variety in rich beautiful colors and interesting forms of ornamental plant

life. Not the rock garden of Japanese make with Oriental stone idols and foreign inscriptions, with a vegetation restricted to the native plants of the land of its name, but the American rockery, built by ourselves as the sanctuary of the plant lover in which he may, without the least restriction, cultivate and enjoy a wealth of blossoms of fairest hues regardless of their nativity. Experience in this field soon reveals the fact that self-interest, self-action and the exercise of individuality on the part of owners is the best guarantee for success. For this reason it becomes at present part of our business to crystalize interest and kindle the enthusiasm in this direction among our garden owners.

Of the Arenarias in cultivation the variety *grandiflora* is covered with snow-white blossoms during May and June. *Arenaria Rosani*, syn. *A. graminifolia*, mid-Summer flowering, is distinguished by hirsute foliage; likewise appear the dark-green leaflets of *A. rotundifolia*, highly attractive. When in flower they are buried under a cover of white. The blossoms of *A. rupestris* remind us of those of *Gypsophila repens*. *A. caspitosa* resembles a vivid green carpet bedecked in Spring with legions of small white flowers. The best of all the sandworts, however, is *Arenaria montana*. Our illustration shows a single specimen in full bloom. This variety with its abundance of large white flowers is a gem for the rock garden and proves invaluable for the dry-wall.

Arenarias require full sun and prefer a light sandy soil. Beware of excessive moisture, particularly during Winter. Protect by a light leaf covering. Propagation is mostly done by division.

The angel said unto them, Fear not: for, behold, I bring you good tidings of great joy, which shall be to all people.

For unto you is born this day in the city of David a Saviour, which is Christ the Lord.— Luke 2: 10, 11.

The Christmas Rose

BERTHA BERBERT-HAMMOND

*The hills are white in robes of snow
But lo! upon the Winter's breast
Amid the gleam of frost and ice
The Christmas Rose uplifts its crest.
It seems the soul of Summer flowers
Grown brave to cheer the Winter hours.*

(Edith Willis Lynn.)

TO the little known but exceedingly interesting Black Hellebore (*Helleborus niger*) belongs the unique distinction of being the floral connecting link, between the last flowers of Autumn and the first harbingers of Spring.

The Black Hellebore (so called on account of the dark color of its rhizomes) is also known as the Christmas Rose because it is usually at the height of its season of bloom during the Yule-tide holidays. It is, however, not a rose at all, as it belongs to the natural order of *Ranunculaceæ* or Buttercup family (Crowfoot family).

The plant is perfectly hardy and of easy culture. Being a mountain plant it delights in a rich, moist soil such as may be found on a sloping sheltered hillside, but it will thrive nicely in ordinary garden loam in a partially shaded situation. To guard its white blossoms from splashes of mud or other weather damage, it is advisable late in the Fall to use a mulch of moss or clean leaves. A glass covered frame will protect the flowers from injury and from extreme cold. This kind of protection results also in an improvement in the quality and quantity of bloom. After the flowering period a mulch of stable litter or an application of liquid fertilizer will do much to tone up the plants and encourage growth.

The rhizomes or root-stocks of these desirable plants,

which are not expensive, may be obtained from plant dealers, and set out either in the early Autumn or early Spring. After two or three years, the clumps may be divided and the new plants, thus obtained, reset.

Considering its many commendable qualities it is rather surprising that the Christmas Rose is not more widely known and found in the outdoor garden. Imagine the thrill of the novelty of sweeping away a covering of snow on a mild mid-Winter day and being able to find and pick, for days of indoor enjoyment, fresh buds and flowers with their accompanying dark green leaves! This one peculiar characteristic of having its season of bloom when no other outdoor flowers are in evidence should assure the lasting popularity of the charming Christmas Rose. A fact not generally known is that plants of this variety potted in the Autumn and grown in a cool window will produce indoors, blossoms that will retain their freshness and beauty for a week or more.

Not only are the large white flowers beautiful, but the leaves are also attractive and as the foliage is practically evergreen, the thick, shapely leaves retain their charm during most of the year.

As the Black Hellebore is supposed to be a plant of great antiquity, there is much interesting folk-lore associated with it. According to an old tradition, out of pity an angel allowed Adam and Eve to take this one flower (the Rose of Affection) with them when they were driven out of the Garden of Eden. Among the people of the Alsatian Mountains where the Christmas Rose is found quite abundantly, there is a legend that this flower first came into bloom at the hour of the birth of the Christ Child and has ever after been known as the Christmas Rose.

How to Vary Our Floral Species

THE little campaign that I have undertaken for at least the partial abandonment in our gardens of one-color masses composed of common plants (geraniums, begonias, *anthemis* or *salvias*) and for replacing them with many-colored perennials, with a succession of flowering, would appear to have been sufficiently approved of.

There is besides, this new tendency, a reason of the first importance—economy. To produce plants generally employed for massing, which are propagated by cuttings, there is need of coal and a furnace. If they are replaced with perennial plants the expense is nil, aside from the cost of producing them the first year, and if annuals are involved there is only the small expense of the seed.

In the article entitled "Flower Gardens," published in this journal in which I defended at every point the theme that engaged us, I hardly had in view perennials plants of which the great lovers of horticulture know so well how to compose their mixed borders. But the same beautiful effects can be obtained with annuals of easy culture, and it is to them that I would devote this plea, or rather to some among them that are not enough appreciated.

Every one, to be sure, is acquainted with the popular plants: Queen Marguerites, zinnias, petunias, balsams, etc., and against them could not be made the reproach of common-placeness that I addressed above to the gera-

niums. And nevertheless, the progress that has taken place in each of these classes has at times transformed their forms or their color to the point of rendering them unrecognizable. For example, zinnias, so justly blameworthy because of their appearance of flowers made of zinc, have lost their stiffness in the new funnel-shaped flowers; the Queen Marguerites, too regular, have become graceful and ruffled in the varieties Comet and Mammoth, and in the Unicum, called Electric because of the radiant form of its flowers. The petunias have shortened their petals and brightened their enlarged throats with colors so diverse and so rich that the name *superbissima*, which has been given to them, would not appear at all extravagant to those who possess a truly select strain. The antirrhinums are no more the common snapdragons of our grandmothers; their flowers have enlarged and the colors have become not only numerous, but delicate and of a character unlooked for. Campanulas have appeared with an ornamental collarette, in the strain called *calycanthema*; pansies are marked or striped, while the flowers are enlarged.

I do not speak of dahlias, which are not, properly speaking, annual plants (that is to say, continuing only a year) but they are to be noted for transformations that are extraordinary to the extent that their old round and regular flowers have disappeared, replaced by pleasing collarettes,

or with those having petals fine and pointed, resembling Japanese chrysanthemums (cactus dahlias); or gigantic, with two or three rows of petals, very ornamental and of a very artistic effect (colossal dahlias); or again with small quilled petals resembling anemones or pyrethrums (glona dahlias).

But the principal aim of this article is to draw the attention of the lovers of gardens to certain species that are not known like the preceding and which merit cultivation, nevertheless, in a manner to vary the effects of the bedding that I have praised in the developing of parks.

In the first rank I would cite the *Salpiglossis*. It is supremely a plant possessing colors both rich and varied, though but little known. Recently a lady in Lyons, who knew how to appreciate its merits and who, after some years, showed it to her astonished friends, asked me to call attention to this plant. I understand her admiration, but I do not know of anything more beautiful than these flowers of striking tones, varying from golden yellow to crimson-red and to an intense violet, veined and striped like lace, of clear tones and of soft velvety shades. There too the name *superbissima*, given by the gardeners to this strain, is not at all an exaggeration. Their culture is simple and easy, and there is no reason why they should not take the place in gardens that they deserve.

I pass to another plant that has been pointed out to me by another citizen of Lyons, and which is as far from being appreciated in France as it is in California, the country of which it is the state flower. It is true that its barbarous name makes one think of the definition given to botany by a humorist, "The art of insulting plants with Greek and Latin," is against it. It is the *Eschscholtzia*. The spelling could evidently eliminate two or three useless consonants; but it is a matter of rendering homage to a Swedish or Danish naturalist, Eschscholtz, to whom this plant has been dedicated, at the risk of impeding its spread. This poppy has elegant flowers of yellow colors, and particularly of saffron and orange, extremely rich and brilliant. One variety, called Mandarin, has even roseate tones, darker on the reverse of the petals. But besides the incomparable effect of its flowers, which moreover open and keep a long time in water, this plant has the advantage of being extremely hardy. It prospers in the driest and sandiest soils, like those of the country of its origin, and it forms large clumps of a grand effect. Its flowering is of long continuance, from June to October, and its culture (sowing in its place), does not present any difficulty.

Another plant, the *Clarkia*, merits its name "pretty," because of its flowers with four petals at right angles, of varied and pleasing colors.

Cuphea miniata, which derives its name from the bright red color of its lacinated petals, is of a flowering season quite prolonged for an annual.

There are few plants as beautiful as the godetias, when they have succeeded well, as they form veritable clumps covered with bright satiny flowers; but under our climate of Lyons, they do not always give the effect expected.

Pentstemons, said to have gloxinia-like flowers, by reason of the richness and variation of colors that have been obtained in them, are in the number of the actually most decorative of known plants.

More use is made now of copper-spotted *minulus*; but nevertheless many people express their wonder and inquire for its name as they contemplate in the Spring the beautiful masses which the gardeners of the city of Lyons plant before our monuments.

The odorous centaureas, which some call amberboas, to distinguish the bluets or other centaureas, now have large flowers, of very ornamental form, in the strain called Imperial.

Why is the Souci cultivated so little? Is it because of its sad name? There are few plants, however, that produce a better effect, and which are of a more beautiful yellow. I think that my readers have not any more the aversion of former times for this color, the most truly decorative, and that they profess for it the love that Marshal Berthier, chief of the staff of Napoleon, had. He loved it to such an extent that all his household servants and chamberlains were dressed in that color and were called, for this reason, "The canary-birds of Mons. Prince de Neuchatel."

In addition, for those who do not wish decisively to rally to yellow, there is a Marigold, Prince d'Orange, which has flowers of a beautiful orange tone. It is necessary to be sure, in the case of Marigolds, to have a good strain, with very large flowers quite double.

While we are on the subject of yellow flowers let us say a word concerning sunflowers of which one variety, called *cucurbitifolius* (with the leaves of a gourd) is of restricted habit, permitting its use in borders. A sub-variety, called Orion, has twisted petals, like those of a small cactus dahlia. But these yellow sunflowers have been transformed also. They have become red, or rather of a chestnut, near red. Better still, they have in the new variety Excelsior taken the most diverse forms and colors and the most varied, from cream-white to old rose and to dark reddish violet. Their low habit facilitates the employment of them also.

Always in the most decorative red and yellow colors, mention must be made of *Gaillardia de Lorenz*, with lacinated tubules so numerous, when they are very select, that the flowers form veritable balls of grand and lasting effect.

And the Gauras, with their large branches, long and flexible, which last the entire year, resemble hovering butterflies. There are many others that ought to be mentioned. But I have wished only to draw the attention of lovers of flowers to the effect that can be obtained with species of simple culture and least costly, and which are not sufficiently employed.—PHILIPPE RIVOIRE, in *Revue Horticole*.

THINGS AND THOUGHTS OF THE GARDEN

(Continued from page 794)

its petals. The flowers are self-colored of a beautiful orange tint.

"Nimbus," one of the varieties that was given an Award of Merit by the Royal Horticultural Society, is very distinct, having flowers of copper and gold, with a crimson ring around the base of the petals.

There is one variety which we unfortunately missed, described in Mr. Morris's catalog, which must be a wonderfully fine plant. It is reported to be the tallest of the Montbretias—attaining a height of four and one-half feet, and "over one hundred and thirty flowers and buds of a fine, rich dark color have been counted on one branching stem."

That these Montbretias have impressed the Floral Committee of the Royal Horticultural Society is evident from the fact that Mr. Morris was awarded a gold medal for a group of them shown in August, 1918, that eight of them have received Awards of Merit, and one a First Class Certificate. They should have a great future, both as cut flowers and as garden plants, if they prove to be of a sufficiently hardy constitution. Our impression, when looking over those grown at Earlham Hall, was that some of them might prove to be somewhat "miffy." We are planning to grow a collection of some of the best of the varieties at the Brooklyn Botanic Garden with a view to determining their adaptability to our climate.

A Few of the Newer Dahlias

W. H. WAITE

TO the dahlia enthusiast, the novelties of the year are always a source of enjoyment and interest; sometimes there are disappointments, a few not doing as well as might be expected, not coming up to descriptions or expectations, yet we are always looking for improvements and the enthusiast



Judge Marean

cannot be without the new ones. Most of the novelties that I purchased last year have done exceedingly well, and I give here a few notes which may help some readers who wish to add to their collections.

The past season has not been what one would call a very good one for the dahlia; during August they did splendidly, but the greater part of September was altogether too warm, and consequently many of them suffered. Therefore if any variety has not quite come up to expectations, I should not condemn it but would give it another trial. I have been more and more impressed the past season on the advisability of late planting, for the section of the country, in which I am situated, Monmouth County, New Jersey. I would not advocate planting before June first, and I make several plantings a week apart.

Personally I prefer young plants, as I always secure better results from them, provided they have been propagated at the proper time, and not allowed to become stunted. If one is using tubers, care should be taken that the tuber is perfect, and divided to only one eye.

The following varieties I have given a good trial. While I am discarding some twenty-five varieties this year, the ones I mention will, I think, have a permanent place in my collection for quite a few years.

Charm. Decorative, one of Judge Marean's varieties and a splendid grower, wonderful vigor, flowers on long stems, and a beautiful burnt orange color. This will make a fine commercial variety.

Earl Williams. Decorative, a fancy variety from California that attracts attention everywhere. The flowers are almost white with red on the edges of the florets. Like many other fancies, sometimes there is more red than white, and vice versa. When you have a flower with the even mixture of color, it is very distinctive. It is also a good grower and a free bloomer.

E. T. Bedford. Hybrid decorative, from Judge Marean. It is a monster flower, and I used to think that people exaggerated when they said they had seen a dahlia twelve inches in diameter, but I have had several blooms of this variety, twelve inches and slightly over. The flowers are produced on good stout stems, and are purplish in tone with a silvery reverse. It is a splendid exhibition variety.

Jersey's Pride. Hybrid decorative. I have given this name to one of my seedlings which I believe will have a future. It was one of the varieties entered at the test garden at Storrs, Conn., and I believe that it scored high and gained a certificate. I have received several letters from people who saw it growing there, giving it great praise. It is a seedling between George Walters and King of the Autumn, and so far possesses all the good points and none of the bad ones of its parents. The flowers are a bronze shade, produced very freely on long, straight stems, well above the foliage.

Mrs. I. de Ver Warner. Decorative, from Judge Marean. If Judge Marean had never raised any other



Mrs. Josiah T. Marcu

dahlia but this one, this alone would have made him famous. It is, I think, without any doubt the finest dahlia that has ever been introduced. It is a wonderful grower and the large, cattleya colored, perfectly shaped flowers are produced on long stiff stems. The

large flowers look right at one, just like a sunflower. I have cut stems of this variety five feet in length. It is a profuse bloomer and was the cynosure of all who saw my collection this year.

The Emperor. Decorative, one of Judge Marean's which is to be introduced this year. I was fortunate in getting a bulb of this variety from the introducer to try the past season, and I can certainly testify to its superiority. It is a beautiful dark, self color



Mrs. I. de Ver Warner

flower of large size and great depth, on long stems. There is absolutely no weakness about its neck, in fact, it is without a fault, and one of the grandest dahlias I have ever seen. This and Mrs. I. de Ver Warner, I prophecy, will be in the forefront of many years.

Mephistopheles. Hybrid decorative. A variety I have always admired in Judge Marean's collection and I was very eager to get it. It seems to be of a different type from the ordinary run of varieties; the plant does not branch so much, very few lateral branches being formed. The flowers are borne on very stiff stems and are placed right on top of the stem. The flowers are large, well formed, and of a beautiful shade of ruby. I have had many flowers over ten inches in diameter from very late planted plants.

Mable B. Taft. Decorative, a new yellow from California that has all the ear marks of a good one. Unfortunately, this variety was not in flower with

me during the shows. The flowers are large, splendid in shape, and a rich, golden yellow, produced freely on very good stems.

Rookwood. Decorative. Here is I think the very best variety that I have yet seen from California; somewhat dwarf in habit with me, but it has beautiful, dark pink flowers, and produces very freely.

Shudow's Lavender. Decorative, a very pretty shade of lavender from California. It is a tall grower with the flowers produced on top of the stem. The color faded out to nearly white during the hot weather. I shall try this variety again, though I am not very favorably impressed with it.

Patrick O'Mara. Decorative. While this variety has somewhat disappointed me, I think it is only due to the extreme trying conditions. It was very good with me during August, but during September the florets turned very bad, before the flower was fully developed. It has a fine stem and while I do not think it will ever make a great exhibition flower, I believe it will make a good commercial variety. The flowers are a golden yellow and produced freely. I have seen it stated somewhere that, unlike its parent, the King of Autumn, it never produces single flowers. I had twelve plants, all propagated from one tuber, and one plant produced nothing but single flowers. The others produced perfect flowers right to the end of the season. The sporting habit in the dahlia is indeed very puzzling.

Mrs. G. Elkins, Jr. This new variety, introduced by H. F. Michell is one of great merit. The flowers are large, on good stems, though they are somewhat inclined to hang their heads, not enough however, to call the plants weak necked. In color, it rather resembles U. S. A. but it is much better with me than the above, as it never becomes pæony, until about the last of the season, when they all more or less show open centers.

I have had many other novelties on trial, but these are the best of the new ones, as they showed up with me during the past season.

THE PRETTIEST CHRISTMAS WREATH

(Reginald Stevens Kimball)

Wreaths of Laurel wound with Holly,
Wreaths that hold the Mistletoe,
Wreaths bespeaking season jolly
Wreaths that hope and good cheer show.

Wreaths with bright Poinsettias merry,
Wreaths bedecked with ribbons gay,
Wreaths that hold the dark red berry,
Wreaths entwined with leaves of Bay.

Best of Christmas decorations,
Telling of our joy complete,
Symbol once of heathen nations
For their victors in the meet.

Then for winners only telling
Of their prowess in the game;
Now for all a message spelling
That for all remain the same.

Wreaths the Christmas gladness sharing
At this season have their place,
Therefore let us each be wearing
Wreaths of smiles upon his face.

—Newport Herald, Dec. 25, 1920.

Epiphytes, Parasites and Saprophytes

WILLARD N. CLUTE

THE great majority of plants are independent species, living in the soil and taking from it, or from the air, the materials of which plant food is formed. There are others, however, which have adopted very different methods of food-getting and being thus out of the ordinary have more than the usual claims to our attention and interest. One group of considerable size has taken on a number of animal characteristics. The species have lost their chlorophyll, the substance which enables them to make food for themselves, and are, therefore, obliged to live on other plants, just as animals do. Some of these actually attack living animals or plants and tearing down their tissues appropriate the material to their own uses.

Those which attack living things are known as parasites. They occur in all parts of the world and prey upon a great variety of plants, but are most common, of course, in the tropics. Many are so highly specialized that they are limited to a single host. Certain species live on pollen grains only, others are nearly confined to the ovaries of grasses, and still others are parasitic upon subterranean insect larvæ, replacing the tissues of the host with their own tissues and incidentally becoming an article of food much relished by certain savages. There is scarcely an animal or plant that is not attacked by one or more parasites. Even man, himself, is host for a score or more of different species. Some of these are seldom thought of as plants, especially those that cause ringworm, thrush, and dandruff. The bacteria of disease are of course parasites, though few people are familiar with the fact that they are plants. Among the more curious parasites that infest plants are the species of rust—thousands in number—which require two different hosts to round out their life histories. The well-known wheat rust begins life on the barberry, the corn rust occurs first on the oxalis, the apple rust is found on the cedar, and the poplar rust originates on the larch.

By far the greater number of plant parasites are found among the fungi but others are flowering plants. Of the latter it has been estimated that at least twenty-five hundred different kinds are to be found in different parts of the world. The parasitic fungi are for the most part insignificant in size—the bacteria are the smallest of living things—but their capacity for harm is out of all proportion to their size and is due to the rapidity with which they multiply. The rusts, smuts, mildews, blights and rots that attack common plants are either bacteria or closely allied plants. The parasitic flowering plants, on the other hand, are often of considerable size; in fact, the *Rafflesia*, a parasite upon various large lianas of the East Indies, has a flower more than nine feet in circumference—quite the largest flower in the world. Most of the parasitic flowering plants are parasitic upon other flowering plants, but the Indian pipe is said to reverse the usual condition and become parasitic upon a fungus. There are a few fungi, also, that are parasitic upon other fungi.

As a result of their peculiar life habits, the structure of parasites is often greatly altered. In the flowering plants, for instance, the leaves are very small or absent and have no chlorophyll. Often the stem is short or weak and there is a lack of differentiation in the tissues of the embryo. All complete parasites are pale in hue, or if colored, the color is other than green. One of the most familiar of our flowering plant parasites, the dodder, has

a slender orange-colored stem which looks like a tangle of copper wire amidst the vegetation of its haunts. The embryo of this plant well illustrates the reduction in structure of a parasite. It is so degenerate that it has no seed-leaves or cotyledons. The Indian pipe and the broom-ropes are pale and ghost-like species, the former often called corpse-plant or ghost-flower because of its pale and waxy texture.

Among the flowering plants some species are only half parasites. They have leaves in which there is more or less green and thus are able to make part of their food. Such species often delude the novice into thinking that they are self-supporting plants, especially when they are growing in soil, but their true nature is revealed by digging them up when the roots are found to be fastened to those of other plants. The mistletoe, on the contrary, is one of the half-parasites that grow on the branches of trees and is thus easily recognized.

All parasites live by tearing down the tissues of their hosts in various ways. Some begin life by germinating on the leaves and stems of plants and find their way into the interior of the plant through the stomata. Once within, they spread from cell to cell, or the plant body may remain in the intercellular spaces and send sucking organs, *haustoria*, into the cells to absorb the cell contents. The flowering plant parasites seldom enter the host, but instead send *haustoria* into the plants at every point of contact.

Parasitism occurs in many plant families, but in some it is so prevalent as to be essentially a family characteristic. In the broom-rape and mistletoe families practically all the species are parasites. The figwort family has few complete parasites but half-parasites are common. Among the best known are the yellow foxgloves, cow-wheat, lousewort, and painted cup. The orchid and heath families also contain many parasites and half-parasites.

It is often a matter of some difficulty to distinguish between the true parasites and those species called saprophytes which live on dead organic matter. The two are often closely related and there are certain curious forms which are facultative parasites and may begin life as saprophytes but, spreading to living tissues, ultimately become parasites. There are other saprophytes, also, that cannot become parasites of themselves but which may be induced to become so in the laboratory by feeding with the proper substances, such as dilute sugars, until they get started. In Nature, plants often secrete substances in their cells that hinder parasites from entering.

Saprophytes abound in most groups of the fungi. Among the bacteria there are probably more saprophytic than parasitic forms. The flavors of butter, cheese, sour kraut, tobacco, and many other substances are due to the activities of saprophytic bacteria and so are the ptomaines and toxins that occur in nitrogenous foods. All the yeasts are saprophytes and a large number of others are found among the molds, mildews, and sac-fungi. Camembert cheese owes its flavor to a saprophytic mold. All the rusts seem to be parasites, but among the so-called higher fungi, comprising the earth stars, mushrooms, puff-balls, and the like, saprophytes are greatly in the majority.

A considerable number of flowering plants were once thought to be saprophytes, but as the knowledge of these plants has become more exact, most reputed cases of saprophytism have turned out to be something else; in fact, parasitic or half-parasitic flowering plants outnumber

them many times. There are, however, a large number of colorless flowering plants that, like saprophytes, seem to require nearly pure humus for their growth and are never found except in localities where rotting leaves are abundant. It is now thought that such plants have formed a partnership, or *symbiosis*, with various fungi, or that, as in the case of the Indian pipe, they are actually parasitic upon it. It is well-known that many flowering plants have roots infested with fungus which they do not seem able to get along well without. In true symbiosis, each partner is supposed to contribute something toward the common good. In the present case, since the flowering plant does not produce root hairs, it is conjectured that fungi supply the place of these and perhaps digest certain substances in the soil for the use of both partners. Many fungi, however, are known which are able to absorb sugars and starches from decaying leaves and do not, therefore, require association with other plants. The union of these with a flowering plant has every appearance of being a case of parasitism on the part of the higher plant.

A still more curious union of this kind is found in the *prothallium* or gametophyte of many fernworts, which are not only colorless but subterranean. So rare are the prothallia of the club-mosses that those of many species have never been seen. All such prothallia must be either parasites or saprophytes. Possibly it may be nearer the truth to say that they are half-parasites, half-saprophytes.

There is probably no class of plants in the world more useful than the saprophytes. It is true we do not make use of many of them directly, and food plants are of more immediate value, but if it were not for the saprophytes to remove the dead parts of plants by decay, the ground would long ago have become so encumbered with dead vegetation that there would be no room for the food plants to grow. It was once pretty well accepted that the fungus saprophytes are derived from degenerate algæ, but a good many botanists now hold that fungi have existed since the beginning and have assumed their various forms through evolution exactly as green plants have done.

In the popular mind, still another group of plants are often confused with parasites. These are the epiphytes which, like the others, live upon other plants, but differ in using them only for support. In tropical regions where moisture, warmth, and light are most abundant the press of plants is so great that there is no longer room for all on the ground, even if the tall and dense forests favored by such conditions allowed sufficient light for growth to penetrate to the ground below. The soil is thickly covered with plants that can endure the shade but the herbaceous species that require more light are obliged to secure locations on the branches of trees or perish. Such forms are often given the very descriptive name of "perching plants" since they use the larger plants for support. Although epiphytes have their highest development in the tropics, there are a few even in temperate regions, but they are pretty generally low forms of life such as mosses, liverworts and lichens, which can endure considerable cold and drought.

Epiphytes are often spoken of as "air plants" and many people suppose that there is a single species entitled to be called by this name, which lives upon air in a manner different from other plants. Epiphytes, however, are no exception to the rule among green plants and require the same food materials. The problem they have solved in becoming epiphytes is simply how to get the required elements in the places they inhabit. Of the elements likely to fluctuate in amount, water is the most important. Epiphytes, therefore, seldom occur except in regions of abundant rainfall. Even here short seasons of drought

are likely to occur and in consequence we find many devices for securing water while it is to be had and storing it up against a time of need. Some kinds of pitcher-plants store water in the pitchers and many members of the pineapple family have leaves with clasping bases in the hollows of which little cisterns of water accumulate. In such cisterns, at least one little insect-catching water-plant—a species of bladderwort (*Utricularia Humboldtii*)—finds a home and thus becomes an epiphyte upon an epiphyte. A large number of orchids have curiously modified stems, called pseudobulbs in which water is stored, while some of the sword ferns have little bladder-like tubers upon the rootstocks that contain water.

Among epiphytes, species having a thick epidermis, or covered with hairs and scales, are the rule. Species with thin leaves usually have some provision for dropping them in seasons of long-continued drought, only the fleshy rootstocks remaining alive. A large number of orchids have roots with a highly specialized cortex which acts like a sponge in soaking up water when it rains, and some of these have the added faculty of absorbing moisture from the air between showers. Such roots produce no root-hairs, nor do they attempt to attach the plant to its support. Instead they hang down in clusters and act simply as absorbing organs. Other plants may begin life as true epiphytes but in course of time they send down long roots that finally penetrate the soil and supply some of the food materials. Such plants then become half-epiphytes. True epiphytes obtain their mineral matter from the dust washed down by rains, from the decaying leaves that may find lodgement among the roots and from the bark of the tree to which they are attached and into which some of their rootlets may penetrate.

Most epiphytes have devised special forms of roots for retaining their hold upon their supports. The main roots may be flattened and, clinging close to the bark, give off great numbers of processes like root-hairs, which unlike these organs in other plants are rather permanent in character and function as holdfasts instead of absorbing organs. The roots of epiphytic ferns are often thickly clothed with these brownish, root-like organs that cling so closely to the bark that it is much easier to tear off bits of the bark than to loosen the roots when collecting the plants.

The principal tropical epiphytes belong to the orchid, fern, club-moss and pineapple families. Nearly three hundred species of wild pines, as the plants of the last mentioned family are called, are found epiphytic in the tropics. One species, the so-called gray or Spanish moss, is found on trees in the warmer parts of the United States. Among other tropical epiphytes are species of figs, peppers, and cacti. Some epiphytes are quite inconspicuous and are almost hidden by the mosses that share their habitats with them, but the great majority compare very favorably in stature with terrestrial plants. In favorable situations they often crowd the trees in immense numbers—thousands on a single tree.

Blow, bugles of battle, the marches of peace;
East, west, north, and south let the long quarrel cease;
Sing the song of great joy that angels began,
Sing of glory to God and of good will to man!

Hark! Joining in chorus
The heavens bend o'er us!

The dark night is ending and dawn has begun;
Rise, hope of the ages, arise like the sun,
All speech flow to music, all hearts beat as one!

JOHN GREENLEAF WHITTIER.

December Birds

PAUL B. RIIS

DECEMBER is the last chapter in the yearly cycle of months. We barely should care to close a book without reading its final chapter, even following up its sequel if there be any. So it is in Nature. We must look to December to finish the season's work, to complete the data of the field book. The presence of that warbling, vireo, orchard oriole and rose breasted grosbeak are easily explained now, their cunningly concealed nests now darkly revealed against the leaden December sky. And in other places where we often met the yellow warbler, the woodthrush and the woodpecker, slinking away at our approach; we now hold their secrets. December therefore is essential to the Nature lover, as it supplies the answer to many half-formed questions.

No seasonal changes cover a wider range during any month of the year than in December. While often we find November prolonged well toward the first of the new year with a "green Christmas" yet more often we experience sudden changes, a rebellious breaking up of the Summer, a premature assault by King Boreas on lands of a scarcely stilled Indian Summer. The fields and woodlands are soft and brown, leaving little solace for him, who must have a high pressure performance, and yet we, who delight in any of Nature's moods may draw much entertainment from the grounds, barren to any but the appreciative. A last canoe trip down stream will yield the richest returns, for here we may let our eyes feast on many things not found afield.

The fangs of King Boreas in his first attacks have sunk deep. The edges of the river are frozen and the gently lapping waters, coming in contact with its tinkling surface, musically murmur their contentment. Hoar frost covers the ground. The bold stalks of the Jimson weed, adorned with its thorny capsules challenge the Prairie dock, the iron weed and the cockle burr for supremacy on his sandbar, the latter moved there within this century, from regions unknown and to the north. The day is yet young and the sun dog in the sky is a gentle warning of the coming of rain or snow. A splash ahead, where we alarmed a foraging muskrat and the hasty flight of a black duck from the opposite shore indicates our silent voyage downstream and a little further on, another duck, wounded by a covetous hunter is trying her skill in evading this unknown enemy. Another headlong flight by a frightened teal is sufficient evidence that man is held in great distrust, and a little later, a half mile detour afield to get abreast of a small flock of ducks confirms this conviction and nothing is left to the harmless Nature lover to enjoy but an excited unknown species, fast disappearing in the distance. But over here where the wild hemp is growing luxuriously, we see the flitting of many wings and recognize the delightful note of but recent friends, the redpolls. How they endear themselves in their fearless and happy way, appearing to even better advantage than our enthusiastic pen would have them. And here, all around us, everywhere tree sparrows playfully fly from shrub to tree, calling or singing intermittently. No, the song of wild birds is yet with us, and neither have the fangs of King Boreas been able to nip the happy heart of a little roving band of goldfinches.

How beautiful these shores are! We missed the departed wealth of goldenrod and wild asters still wafting in fleecy bracts. The blossom of wild plum, crabapple and haws have also escaped us, but in their stead we

note with wonder and admiration the light shades of the thickets, growing gradually denser, interspersed here and there with the golden touch of willow, the blue and purple shoots of young boxelder, the scarlet of dogwood and meadow rose, punctuated in the distance by monolithic shafts of grey and white, the sycamores. The brown foliage of the oak, the green leaves and stems of the cat brier, still surviving, the seed pod of boxelder, the scarlet fruit of meadow rose and haw, the bronzed and green foliage of great cedars, the hazy distance, the shadings of the horizon require not the artist's imagination to produce a picture worthy of a master. And here is another flash of color, unexpected, disturbed from its piscatorial pursuits, a red breasted merganser, or shell drake, frantically seeking safety in the distance.

The gentle breezes are gaining in force, the waters leaping in challenge, and our spirits rise to the combat, triumphant and happy. We reach the great flood plains, where the early waters had risen ten feet, impounded by gorges of ice; the scraping of bark, the breaking of limb, the bending of bough and the deposits of debris clearly mark the distance. Below, overhanging the water or close to its edge, we note the nests of vireo, goldfinch, and yellow warbler, each distinct in its characteristics, two which held a little family, while the other met with misfortune. And yonder nest of the oriole, swinging violently in the wind, where is its tropical tenant now? But ahead of us there is a great commotion, a flapping of many wings, an unrest, a general alarm, a black cloud of crows, many thousands, gathered in a mighty flock near their roost, or bound southward, we did not learn. Woodpeckers, creepers, jays and chickadees, we also note as we drift along, also a flock of green heads and a hunting rough legged hawk.

Here the winding course of the river is tugging at the very foundation of a magnificent elm, its top already leaning, acknowledging ultimate defeat. And ahead we see another elm, in the last struggle, all submerged but the mighty top, a victim to the relentless forces of its one time benefactor. Here where the north bank falls sharply to the water level, shutting off the north wind, protected by the warm vapors of the stream, we find sneezeweed in bloom. And to belie the lateness of the season, we hear the dry rattle of a kingfisher, and soon perceive him unconcernedly plying his trade; curiously we level our glasses on another bird percher in a willow and yet another to learn that one is a rusty blackbird, the other a red-winged blackbird.

The appended list gives authentic data of the movements of birds during December in Northern Illinois, which region falls within what is known as the Mississippi Valley region, though the river is a hundred miles to the west. This valley is an important highway of bird migrations in that it offers a comparatively easy outlet to the south. The birds mentioned in the canoe trip and not in the list are in some instances occasional winter residents or simply isolated cases due to exceptionally mild weather, and therefore are not included in the check list.

ARRIVALS

December 30 White-winged crossbill

DEPARTURES

December 5.....	Loon
December 5.....	Double crested cormorant
December 10.....	Pine siskin
December 10.....	Bohemian waxwing
December 12.....	Rusty blackbird

Gardening as a Hobby

MOST people like flowers, some because a garden or vases of flowers always improve the outside or inside of a house, some because they love Nature and everything that is hers, and some because of the color and shape of the flowers themselves. Imagine the pleasure gained by the two latter in possessing flowers grown, cherished and brought to a state of perfection by themselves, the flowers are not beautiful strangers, but real friends whose perfections and imperfections only the grower can truly see.

From a Nature or beauty lover's point of view, gardening is an ideal hobby, and I should like to point out a few of its other advantages as an occupation for spare time.

1. Firstly, as most people usually work indoors, they want a free-time occupation that gives them plenty of fresh air and exercise, takes their minds away from business and worry—something intensely fascinating, and that yet repays them for their labor and something they can do whenever they feel inclined, without a lot of preparation and dressing up.

2. Secondly, one wants a hobby to interest one indoors as well as out, and this, gardening does. During the wet weather while one's soil is benefiting by the rain, one can sit comfortably inside poring over the wonderful details of a nurseryman's catalog (and they are wonderful, too) deciding how best to spend one's money, and what sow and where to sow it, so that no time may be lost in carrying out one's dreams when the sun shines again.

3. Thirdly, hobbies are most satisfactory when they pay for themselves and this, after a little while, gardening will do. One can supply the house with flowers, instead of having to buy them at the price they are, one has what one likes instead of what one can afford. One may also grow one's own vegetables, always fresh, always handy, with an added flavor given by the exercise and pride taken in their growing.

4. Last, but not least, comes the fact that there are so many different branches in gardening that one can always satisfy one's own special bent of mind while benefiting by it. Have you a bent towards chemistry—study the different soils, how to improve them by the addition of various fertilizers and manures. Are you a mathematician or designer? Plan out your garden, lay out and measure the beds and paths, improve on them every year if you like. Are you an artist? Paint your garden in harmonious colors and make a picture of it, varying it to suit you. Are you keen on travel? Get plants from different places. Having to know how, where and under what conditions the plants grow will give you an idea of the country where they live. Are you keen on literature? Nearly every plant has a history surrounding it and fables attached to it, while the history of gardening itself is an interesting study—and thus everybody may find a branch of gardening which appeals particularly to him or her.

To a person keen on making a hobby of gardening, no place is too small for a garden—one may have plants in the house, while a verandah may be made beautiful with many kinds of pot plants—Begonias, Pelargoniums, *Colcus*, Primulas, brilliant flowering Cacti, ferns and hanging baskets. One can even fix up a tiny greenhouse at one end of the verandah and this holds untold possibilities of Gloxinias, Cinerarias, Streptocarpus and the more delicate pot plants. This kind of gardening needs the care and time of an outdoor garden, even more, for

there is watering often three times a day, a great deal of repotting, weeding and grub hunting to do, but whoever knows the delicious look and feel of a well kept greenhouse or verandah considers them well worth the trouble.

Most people have outdoor gardens, and with a little planning these may be made beautiful. Tall Sweet Peas against the hedge, borders of Violets and Pansies, Daisies and dainty Delphiniums, rose bushes, bulbs, perhaps a small lawn, a tiny shaded corner for English Forget-me-nots and Primroses, and a vegetable garden and even a few fruit trees at the back. Of course, there is a certain amount of preparation to be done, the garden dug over, drained (most gardens have water laid on and a tap), paths made, beds raked, and then, one may plant. To start with, it is best to buy most of the plants from a nurseryman (although certain plants, Poppies, Cornflowers, etc., should be sown in the ground where they are to remain). Of course, the season must be taken into consideration, and deciduous creepers, rose bushes, shrubs and fruit trees planted when they are dormant in Winter. When the garden is going one can raise all one's own plants, which is much more interesting and economical. With vegetables, too, the season must be considered—cabbages, tomatoes, etc., bought from the nurseryman, peas and beans, root crops, etc., sown into the ground. When buying fruit trees, too, go to a good nurseryman who will know more about the varieties suitable for your climate and soil than you do—and then think of the pleasure of pruning your own trees and eating your own fruit.

In many gardens there is a small piece of waste ground, perhaps a sunny spot or strip, that is only suitable for a rockery. It is always interesting to build one, and plant it, for the plants are quaint and as Africa is such a dry hot country there are plenty of plants to choose from, and provided there is plenty of soil rammed in between the stones, and the plants or cuttings watered until they become established, they may be left to grow with an occasional weeding and watering, the Mesembryanthemums forming sheets of color in the sun in the flowering season.

One side of gardening that is very interesting is specializing in one direction. Besides the pleasure and pride gained from producing perfect blooms, there is always the thrilling expectation of producing something that has not been seen before. Then, too, there is always the healthy rivalry between oneself and some neighbor specializing in the same direction, and there are always shows and the chance of figuring on the prize list. Roses, Carnations (and one may try growing the seed of both) Chrysanthemums, Dahlias, each is fascinating and worth the attention they require. Books have been written on each one of these so that one can learn as much as one likes about them, though nothing teaches like each year's experience. Another interesting line one may have in one's garden is the collection of some special kind of plants,—herbs, bulbs.

Of course, in gardening, one must expect the drawbacks that occur in everything, accidents will happen and one is bound to make mistakes. The boy may pull up your plants, mistaking them for weeds, you may forget to water at a critical moment, your water supply may be cut off, but in spite of these and other misfortunes, such as plant diseases, (which can generally be cured) that may happen, sooner or later plants always repay you if

(Continued on page 807)

Work for the Month in the Garden

SAMUEL GOLDING

TO speak of work in the garden during December, may seem somewhat out of the question, but the mild and open weather which we have experienced this Fall and early Winter may have delayed the giving of final protection to those plants which may succumb if left to the mercy of the elements. Now the most important work on hand is to provide the more tender subjects with adequate protection so that we can look forward with confidence to their certain revival next Spring.

No doubt all preparations have been made to have protective materials on hand in case of a sudden demand for them. Wind breaks of corn stalks can be placed around rhododendrons and azalea beds where they are planted in an exposed position, or if placed to break the prevailing winds, will do much to enable them to withstand the rigors of Winter safely. Give the beds a good mulch of leaves.

Screens of canvas, burlap or other suitable protective material may be placed around evergreens which are liable to suffer from the cutting winds and severe frost. If wire netting has been placed around rose beds or other subjects to be protected, the leaves or other protecting material can be placed in position after the ground has become frozen. This prevents the frost from entering, but also shuts out the heat, which keeps the basal buds dormant, and prevents harm from alternate frosts and thaws, which is so detrimental, especially to surface rooting plants.

A few spruce branches spread around will prevent the leaves from being blown away by the gales. A mulch of manure or leaf soil is beneficial to the herbaceous border, especially to those plants which have no Winter foliage. Care must be exercised when protecting plants with foliage; a rough strawy mulch through which the air can penetrate freely is the best.

Strawberries should be given their final protection and leaves and corn stalks are the most satisfactory. Salt hay or straw can be used, but avoid if possible anything which contains seeds as this will be a source of trouble later on.

Where raspberries suffer during the Winter, protection must be afforded them. This can be given by laying the canes on the ground and covering over with soil, or they can be tied up and protected with straw.

See to it that celery wintering outside has enough protection, and cover spinach with salt hay. As a precaution against very severe weather, bank fermenting materials around pits and frames. Admit air on every favorable opportunity to plants wintering in the frames and remove all decaying foliage.

Now that plant growth has practically ceased, preparations may be made for next year's work. This can be done by placing under cover good stocks of compost, loam, leaf soil and sand for propagating; sowing seed and transplanting seedlings.

Make up any deficiency of flats; gather and sharpen pea brush and bean poles. It is best to replenish all tools and things needed for next year during the Winter months to have them on hand when wanted.

Continue to bring in successional batches of rhubarb, seakale, asparagus, and chicory for forcing. Collect materials for mushroom beds as soon as those first spawned show signs of exhaustion. Inspect at frequent intervals the stock of fruit, potatoes, etc. Remove any

showing signs of decay, otherwise much loss may result.

During snow storms care should be taken that evergreens do not become heavily overlaid. The snow should be shaken off with poles to prevent harm and possible irreparable damage to valuable specimens.

In mild and open weather advantage can be taken to push on with work on the land, walks and drives, thinning and pruning old trees in the orchard. The first Winter spray can soon be applied.

Sprays effective as insecticides and fungicides are desirable. These are freely advertised, and can be obtained from all seedsmen, with full directions for use. Lime sulphur is a popular and effective spray and can easily be made up at home. There are several formulæ for making this up. The following one is very good. Place about ten pounds of fresh quicklime in a wooden barrel large enough to hold fifty gallons; pour on enough water to cover it. As soon as the lime begins to slake, pour in ten pounds of flowers of sulphur, stirring it well to make a thorough mixture. Add enough water to cover it and then place sacking over it to keep in the heat and allow it to boil twenty minutes, stirring occasionally. Make up this mixture to fifty gallons with water.

The present season has been remarkable for wealth of color and abundance of berries on the various shrubs. Home grounds which have been planted with an eye for Winter effects give the gardens a picturesque and cheerful touch of color during the dull season. In gardens of small and limited areas it is often impossible to spare the room, but this is a feature that is worth while. Everyone is familiar with *Berberis Thunbergii*, which is now a conspicuous object, its bright berries persisting for a long time. Groups of *Rosa multiflora*, and *R. lucida* and varieties of *Crataegus*, *Cotoneaster horizontalis*, the bush honeysuckles, *Lonicera tatarica* and *L. Morrozeii*, the Snow Berry.

Symphoricarpos racemosus, *S. vulgaris* combined with plantings of evergreens and deciduous shrubs used for their colored barks or stems such as the varied cornus, and willows, bright green of *Kerria japonica*, the silvery barks of birches, *Eleagnus longipes*, *Euonymus alata*, the cork barked burning bush, are a few of the most common, and generally useful for Winter effect.

Mankind needs a world-wide benediction of understanding. It is needed among individuals, among peoples, among governments, and it will inaugurate an era of good feeling to mark the birth of a new order. In such understanding men will strike confidently for the promotion of their better relationships, and nations will promote the comities so essential to peace. . . . I would like to acclaim an era of good feeling amid dependable prosperity and all the blessings which attend. . . . The world has witnessed, again and again, the futility and the mischief of ill-considered remedies for social and economic disorders. But we are mindful today, as never before, of the friction of modern industrialism and we must learn its causes and reduce its evil consequence by sober and tested methods. Where genius has made for great possibilities, justice and happiness must be reflected in a greater common welfare.—PRESIDENT HARDING.

The Greenhouse, Month to Month

W. R. FOWKES

DECEMBER'S chilly blasts remind us that we have reached the end of the season of growth for most plants. It is the harvest period when numerous plants indoors are in full bloom.

The people who grow indoor grapes will realize it is time to prune the vines. Cut back to two eyes for the ordinary kinds, but if you are numbered among those who grow large bunches and allow the quality of fruit to be the last consideration, you will be growing the variety, Gros Guillaume. When pruning this unwieldy kind leave four eyes, for they will not break as readily as Hamburg. If your vine border is outside you must now protect the roots with two feet of strawy manure. Wash the vines with a good strong solution of X. L. All.

In the greenhouse the *Schizanthus* must be kept cool, and water but little. Sow another pinch of seed of large flowering kinds and you will have a continuous display of this fairy-like orchid bloomer.

Sow a small packet of candytuft, giant hyacinth, and grow gently along. In four-inch pots they are exceedingly useful and uncommon.

We have the carnations and roses always with us, but we must maintain a succession of free flowering, inexpensive plants besides the usual bulbous stock whose cultivation is so well understood.

Celosias are charming and for Winter's work I find Carter's Rainbow excellent. Sow a pinch in a four-inch pot and leafy soil is all they require from the start until five-inch pots are reached, which is a most desirable size for Winter work. *Celsia cretica* is another very pretty plant, and the culture is the same as for celosias, excepting that the cooler end of the house will suit it better.

A few gloxinia bulbs that have had a long rest can be started. Prepare a shallow box and moss leaf mold and sand will be a good medium to start them in. Dip the corms first in a light solution of Fungine and you are safe from decay, or fungus trouble.

Tomatoes in pots must be kept on the dry side. Admit air daily, and if closed at night see that the paths are dry. You must fumigate with cyanide every fortnight or white fly will be a nuisance. We must keep up a continual fight against this persistent enemy of the tomato plant.

Fuchsias are wanted for next Spring, so we must rest them for the Winter, either in a cool dry cellar, or under the benches of a 'mum house will do, providing they are laid on their side to keep water away.

Heliotrope standards can now be kept on the dry side, and prune them fairly close to form a good head. They should be kept in a fairly warm atmosphere, and gently syringed once daily and topdressed with Clay's Fertilizer. If the plants are given this attention you will have a wealth of beautiful sky blue, sweetly scented flowers that give a lovely effect when the great outdoor plants are dormant.

Calceolarias must have a very cool position and be placed on coal ashes and not on boards or anything conducive to red spider culture. Soot is the best fertilizer for these charming plants. Bone meal is best for cinerarias, which will succeed with the same treatment as the former plants.

If you have to furnish plants for a conservatory you cannot fumigate them, so they must be dipped.

Lapagerias are beautiful climbers with their waxy bell-shaped blossoms and the coolest house you possess is their correct place.

Camellias have to be kept quiet; do not feed, over-water, under-water, or have a dry arid atmosphere; if you want to keep these beautiful Winter blooming plants to perfection. They are worthy of our greatest care and attention. If your house is allowed to get much higher in temperature at night than 45 degrees, the camellias will not open properly; also a large portion of the buds will fall off. Above all things do not use lime. They will not thrive in a very acid soil.

If you require a plant in a warm house to cover a trellis, grow a Marshal Niel rose. The rose should be already cut back to the hard wood, leaving sufficient half-ripened wood for the breaks. It must be remembered that this finest rose flowers on the annual young growth. Their true tea scented blooms, golden yellow, finely chiselled buds, are always admired when well grown.

Gloriosa Rothschildiana can be started at intervals and grown on a trellis. Their blooms during the Winter are invaluable.

Lorraine begonias can have their blooming period lengthened by pinching off a portion of the buds every week. Late struck plants for Easter should be kept warm and moist.

Gardenias should be kept warm and syringed only on bright days. Be careful that the foliage is dry before sundown or the buds will surely fall off. Feed every ten days with Clay's and fine loam to encourage surface roots, without which they are useless. If galls attack the roots they are futile, so careful watering and clear drainage is important.

Buddleia asiatica and *Farquarhi* should be well fed and watered. They demand a lot of nourishment and frequent syringings to keep red spider at bay.

Deutzia gracilis is a noble plant for forcing, and well repays any care given. They are in good forcing condition if they have been grown in pots all Summer, but can also be forced fairly well if dug up and potted and given a rest or gentle freeze.

Lilacs can be brought inside early next month. Give them a cool position until the buds commence to swell. They will succeed if heat is given, and if brought back when in bloom to the cool house will retain their lovely blossoms. It must be borne in mind, however, that the plants to be forced must have been grown without blooms at least two years in order to be successful.

Cyclamen now like an atmosphere a little warmer and moister than the last few weeks, but about 60 degrees with air is sufficient. Soot water once a week will be all the food required. Over-fed leaves soon fall off and such plants are poor subjects to take to the dwelling house.

Some of our aristocratic subjects, the orchids, have finished their growth. Such varieties as *Dendrobium nobile*, *D. Wardianum*, *D. thyrsiflorum* which are now finished, and to be had in bloom later on must be rested. We do not mean burnt up. Place in a lower temperature. The potting shed or any cool room where the temperature does not fall below 50 degrees will suit finely. Give sufficient water only to prevent shrivelling, once a week is enough.

Cattleya labiata autumnalis may need repotting. It has finished its blooming and is just ready to make new growth. Take carefully out of its receptacle, removing worn out roots and compost. Place in a clean pot or pan and leave sufficient space for the next two years' growth. They do not like to be disturbed and once in two years is all that is necessary. Cut the dead flower sheath completely away because in this variety it is conducive to decay. Peat, moss, and charcoal lumps interspersed is an ideal compost. After repotting keep them away from the hot pipes and do not water heavily. Use an Abol syringe during the Winter months. A little spraying is beneficial.

Oncidium splendidum is sending up its magnificent spikes of bloom. It now requires a fair amount of water. It dislikes spraying and if abused in this manner will be lost. It grows better on the dry side the greater part of the season. Roaches must be poisoned with sugar and paris green, as they will work havoc among orchid blooms if allowed full play.

Laelia anceps is commencing to bloom and is the most congenial orchid we have, but likes a sunny aspect. Its spikes must be protected from snails. All orchids should be sponged monthly with warm rain water. No insecticides should touch them or their fleshy roots will perish. Cyanide fumigation is ideal for orchids and scale and mealy bug will succumb under its use. It must, of course, be used at night.

Blair's prolific cucumber is a small fine-shaped cucumber for mid-Winter work, and does not require the coddling the usual varieties demand. It will succeed in eight-inch pots in any ordinary compost and is no trouble at all, and the flavor is perfect.

GARDENING AS A HOBBY

(Continued from page 804)

you treat them properly, three of the most important points to consider being the following:

Climate.

Soil.

Position.

1. Grow plants that are used to your climate and do not be disappointed if plants used to different seasons do not thrive; it is not always the nurseryman's fault. Plants, such as Daffodils, used to Winter rains and Summer heat in the Cape, cannot be expected to take kindly to Transvaal cold, dry Winter, when the plants want rain so as to grow, or the Summer with the rains when they want to rest. This is where a greenhouse is handy.

2. Another most important point in growing plants is consideration of the soil they like. Just as you would not give a horse meat or a dog hay, so you should not put a plant—bulbs for instance, in stiff clay, or roses that like clay in sand, for plants used to the same climate do not like the same soil. One reason is that different soils contain various degrees of water and a plant used to a light soil where water does remain long will soon rot in a heavy water-logged clay.

3. Position, too, must always be considered when planting, as some plants like the sun, some the shade. Some plants must have the sun to open their flowers, growing long and lanky in the shade, while broad leaved plants become parched and dusty in the sun.

For the actual growing of things, how, when, and where to plant, there are numbers of reference books, the Annual "Flower Garden," "Gardening Magazine," etc.; and books on each subject connected with gardening. If you want any particular kind of soil, loam, clay, leafmold or manure, you can buy them, and if you want to make your garden a lovely, fragrant, living picture,

just take an interest in it, and you will see—well try, and find out!—*South American Gardening and Country Life*.

BIRDS CHECK RODENT AND INSECT PLAGUES

WHEN William N. Craig spoke before the New York Florists' Club last week he made the statement that if the Federal Government would give more encouragement to the propagation and conservation of bird life this action would have a more beneficial effect on plant life than the, in many cases, fruitless attempts to stamp out insect pests through quarantine legislation.

Now comes a Bulletin from the Ohio Experiment Station on "Some Ohio Birds," which reads:

"The increase of rodents, insects and other injurious life would be a natural consequence following the reduction of their natural enemies (*i. e.* the birds). There would also be a decrease of vegetation proportionate to the increase of insects and rodents dependent thereon for food."

The weekly press bulletin of the Ohio Agricultural Experiment Station then goes on to say:

Plagues of rodents have generally followed a reduction in the numbers of rapacious birds. Nevada suffered a plague during 1907-1908 which resulted in great loss to ranchmen. The plague subsided only after the ranchmen stopped destroying hawks, owls, crows, ravens and gulls that flocked into the infested region.

With the exception of the English sparrow, practically all other species are beneficial to the farmer, according to entomologists; and in some cases the English sparrows are developing an appetite for insects and weed seeds, but they still drive away native birds by destroying eggs, young and nesting places.

Note that the usual slam is given to the English sparrow and that it is accused of driving away native birds by destroying their eggs, their young, and their nesting places. Where we live we have seen the English sparrow driven off by native birds, and today there are practically none of that species in our locality. Our native Blue Jay, however, does exactly what the English sparrow is accused of doing. However, if our birds were better cared for and protected so that they would be plentiful on the face of the earth instead of comparatively scarce as they are now in all too many sections, no one need have the slightest doubt but that our gardens and fields would suffer far less from rodents and insect plagues than is now the case.—*Florists' Exchange*.

THE OLDEST LEGEND OF THE CHRISTMAS TREE

ST. Winifred, one of the greatest Christian missionaries, is said to have been cutting down a sacred Oak which had been an object of worship by the pagans. While he was hewing down the huge tree it was blasted and uprooted by a whirlwind. Close beside it was a young Fir tree, which was not harmed, either by the whirlwind or the fall of the Oak. Then St. Winifred is reported to have said to the pagans: "This little tree, a young child of the forest, shall be your holy tree tonight. It is the wood of peace, for your homes are built of it. It is the sign of an endless life, for its leaves are always green. See how it points to heaven! Let this be called the tree of the Christ Child! Gather about it, not in the woods, but in your homes. There it will shelter no deeds of blood, but only loving gifts and acts of kindness."—*Florist Exchange*.

Introducing Our Department on Garden Clubs

BERTHA S. HARRY

GARDENS from the beginning of time in Eden have played an important part in each individual's life, and have been used by poets and writers of all ages as an untiring theme. During the reign of Edward Third, gardening in England began to be of interest, the first work on gardening being written by Walter de Henly at this period. The beautiful gardens abroad as well as in this country show that while many years have intervened since, the interest in gardens has not lagged.

It is hard, indeed, to know just how ideas arrive in our subconscious mind; probably we inherit our love for flowers from early associations with those who have worked in gardens; perhaps a particular plant has interested us enough to make us wish that we could have some; perhaps by raising these particular varieties we became interested in others; again we may have been given a few plants for our very own when rather young, and thus began our love of flowers. I think that my own love of plants grew from the fact that a small space was given to me when a child. My grandfather drew my initials and we sowed lettuce seed in these drawn spaces. The visits that I made to that bed were many, but the sparrow made even more visits. While I never had the satisfaction of having "B. S. H." really bloom forth in lettuce, there was enough, with some imagination, to see the initials. However, the sparrows did not deter me from planting another season, and Johnny Jump-Ups and Forget-Me-Nots were much more successful.

Every garden club has to have a pioneer so to speak in its midst, whether the club is organized through hearing of other such clubs, or whether some emergency gives it birth. This department aims to interest others in the formation of clubs; to bring new ideas from one club to another; to give notices of meetings and dates of flower shows when possible; and by your co-operation make this page pleasant and profitable for you.

THE FIRST GARDEN CLUB

Pennsylvania claims the distinction of having the oldest garden club; the oldest horticultural society, as well as having printed the first horticultural magazine in this country. The Garden Club of Philadelphia is, I believe, the oldest garden club, which was founded April 27, 1902 through the efforts of Miss Ernestine A. Goodman. Its charter was granted on March 6, 1908. There are three classes of members, active, non-active, and honorary, totaling fifty-nine. Regular meetings are held at the homes of members; interesting programs are planned, including lectures and profitable trips. The president is Mrs. Bayard Henry of Germantown, and besides the other regular officers, there are special committees, and correspondents for foreign countries, and the preservation of wild flowers, etc.

THE FIRST HORTICULTURAL MAGAZINE

Philadelphia can also claim the distinction of having been the birthplace of the first horticultural magazine in America. This magazine, known as the "Philadelphia Florist and Horticultural Journal," began life in April 1852 and continued for a period of three years. It was established by R. Robinson Scott.

"The only apology we have to make for our suspension to those of our subscribers who paid us promptly their subscriptions is that a greater number have not paid, and some, perhaps many, do not intend to pay." What have gardeners lost by the quotation from the last issue? The lack of individuals to assume their responsibilities may have been a great loss to us in this day.

OLDEST HORTICULTURAL SOCIETY IN AMERICA

The Pennsylvania Horticultural Society was organized November 24, 1827 at a meeting held in the Franklin Institute, Philadelphia. At this meeting it was "Resolved that it is expedient to establish a horticultural society in the city of Philadelphia for the promotion of this highly instructive and interesting science and that a constitution be framed for this purpose." The first president was Horace Binney, the present president is James Boyd. Meetings are held on the third Tuesday of each month except July and August, and throughout the year numerous exhibitions are held.

The objects of this society, as stated in its charter, are to promote and encourage horticulture and create a love and interest for plants, flowers, fruits and vegetables.

Lectures are given during the Winter by eminent horticulturists. Reports on specimens sent in by members are made by the professors of the society, who are always willing to serve members. The professor of botany is Dr. Stewardson Brown; of horticultural chemistry, Dr. John Marshall; of entomology, Dr. Henry Skinner, and of biology, Dr. Ida A. Keller.

The offices of the society are at 606 Finance Building, Philadelphia, where a library is maintained. David Rust is the secretary.

SEASONABLE SUGGESTIONS FOR CLUBS

Has your club sent plants to shut-ins at Christmas?

Has it made baskets of winter berries, evergreens, etc., for hospitals?

Has it planned to hold services Christmas Eve where memorial trees have been planted?

Is it going to trim small cedars, growing along fences that owners in many cases will be glad to be rid of, as Christmas trees for the children's wards?

Are you, as individuals, giving garden gifts, to your personal friends who are interested in gardens? There are so many attractive gifts.

Are you going to tuck in with every gift, "Scent from my garden?"—the scent being made from rose leaves, lavender, and so forth, collected during the season.

Have you bought bulbs in quantities and are they now ready to be forced into blooming for gifts?

Have you thought of sending a card of greetings at this season to those whom you wish to make honorary members? Giving a gift to those who have been especially kind is really what honorary membership is, is it not?

Enthusiasm is the element of success in every thing. It is the light that leads, and the strength that lifts men on and up in the great struggle of scientific pursuits and of professional labor. It robs endurance of difficulty, and makes a pleasure of duty.—BISHOP W. C. DOANE.

A Lesson on the Window Garden in Winter

Being One of a Series of Lessons of a Home Study Course on Gardening Appearing Regularly in THE GARDENERS' CHRONICLE
Under the Direction of ARTHUR SMITH

IF we consider gardening as a whole, in its widest and most complete sense, there is doubtless no feature connected with it which presents greater difficulties than that of *growing* plants in a dwelling house during the Winter half of the year. These difficulties may be explained by the fact that the general conditions of a modern dwelling house are the worst possible for plant life, although in some cases these conditions are not so bad as they are in others, and it is also generally true that the worse the conditions are for plant life the more unhygienic they are for human occupants. The average dwelling house today is undoubtedly over-heated, ventilation is conspicuous by its absence, and practically every drop of moisture is dried out of the air. Under the system of heating a generation or so ago house plants did not find existence such an uphill job. At the same time it is true that a yearly increasing number of people are becoming wise to the advantages to their health in maintaining a lower temperature, or at least in allowing fresh air to continually enter their homes, with the result that both they and their plants do better.

In most houses the conditions which prevail in the kitchen render it the room most suitable for plant life because of the moisture derived from the steam which comes from cooking, and the fact that a coal range requires the continual ingress of fresh air. Many people in fact look upon their kitchen as their plant hospital. When the cooking is done by gas, the kitchen is not, however, a desirable place for plants.

The health of plants is considerably affected by the lighting system, that derived from gas being the worst, as it not only helps to dry the atmosphere, but the fumes given off from it are very deleterious. The nearest approach to the ideal for house plants is when the dwelling is heated by a system which draws in a continuous supply of fresh air and when it is lighted by electricity. An open fire is a very hygienic addition to a living room, even when radiators are also used; with the latter, vessels can be used containing water to maintain a moist atmosphere.

It is of course one thing to be continually obtaining potted plants fresh from a greenhouse or a florist, which last in good condition a few days, or longer, according to the conditions, the care given them, and the species, and quite another thing to keep plants all the Winter in a good state of health and grow them on year after year until they become practically members of the family. With certain reservations in connection with species which under any conditions are ephemeral in the flowering stage, and which are not particularly ornamental after their period of blooming is over, to succeed in keeping house plants in good condition one must treat plants as household pets. To get this point of view we must realize that plants are practically living, feeling organisms, which respond to loving care, and which soon manifest their disapproval of neglect or of bad treatment.

It is not at all uncommon to hear people remark that their "mother was always successful with her house plants and everything seemed to grow for her, while nothing does well with me." It is true that old-fashioned houses were, as above mentioned, more suitable for plant life than modern ones, but this is not the entire reason. The habits of previous generations caused them to devote more time to their plants; their spirits were more in harmony with plant life, and plants grew for them because they loved them and treated them as fellow creatures. At the same time the psychological side of the question requires to be combined with something more, as, while we are prepared to credit plants with considerably higher attributes than is generally the case, we do not concede them the power of either personal antipathy or affection; but if people will get the same mental outlook towards them which their mothers had, and give their plants the same regular care and attention, they will doubtless obtain the same measure of success.

In going more into detail with the various points which together make for success, we must again emphasize the value of fresh air, but in giving this to plants we must be careful to avoid cold drafts. Opening the windows at the top will allow the air of the room to be changed, and the ingress of fresh air always brings with it more or less moisture. The size of the opening must obviously depend upon outside temperature, and upon whether it is calm or windy. Although the notion is less com-

mon today than it used to be, there are still people who are possessed with the idea that plants are not altogether healthful in a living room and they consider them especially harmful if left in a bedroom all night. As a matter of fact the reverse is the case. Plants are beneficial by reason of the fact that they require carbon dioxide to build up their structure and they therefore do good service by reducing the atmospheric content of this element, which in excess, is deleterious to the human occupants.

There is probably no one more fruitful source of failure both in outdoor as well as indoor gardening than that of watering. All the food which a plant obtains from the soil must come to it dissolved in the water it drinks before it can be digested and assimilated. The only way in which plants can obtain water is through their roots, and therefore they should always have an ample supply of water during their growing period. Success with plants in pots is not possible when they are flooded with water for one period and parched with thirst for another. While there is not much harm in over-watering if effective drainage has been provided, at the same time, to be continually pouring water on to a pot when it is unnecessary tends to impoverish the soil by carrying away of plant food, and is also a waste of time.

Drainage and watering are very intimately associated, for while an ample supply of water must be maintained in the soil, this soil moisture must not be in a free state, or stagnant, and the soil, whether in a pot or elsewhere, must be sufficiently well drained so as to allow all surplus water the soil cannot absorb to drain away. The distinction between absorbed water and that in a free state may be exemplified by a sponge. If we place a sponge in water it will take up a considerable quantity of liquid and if we take the sponge out a large amount of water will be held suspended in the interstices of the sponge, but the actual sponge material absorbs very little, which is easily seen when we squeeze it. The water which is squeezed out is that which was in a free state. Leaving out of the question aquatic and subaquatic species, water in a free state acts more or less like poison to plants, and they suffer more from this when in pots than when in the unconfined soil. The soil condition which allows water to exist in a free state is known as water-logged and the manner in which a plant has been potted has much to do with possibilities in this direction. If the soil in a pot has not been sufficiently firmed around the roots it is slower in draining out because the interstices left in the soil render it like a sponge and it remains saturated for a long time, which causes the fine, feeding roots and their hairs to decay, and a condition of things is thereby brought about which not only prevents a plant from thriving, but which may cause its death. Even if a water-logged state is not of a sufficiently long duration to kill roots it will invariably check their growth and prevent the proper exercise of their functions.

Over-potting, or having the pot too large for the requirements of the plant will also increase the possibilities of a saturated condition, with the consequent souring of the soil, which may be brought under this condition even if the pot is well drained; in fact good drainage fails of its desired effect when a plant is placed in a loose, spongy soil, in too large a pot.

For the purpose of cleanliness to tables and floors, pots are stood in saucers which hold the drainage water, and the evaporation of this water is of benefit in helping to keep the atmosphere moist, but if the saucers remain full of water for a considerable time harm is likely to result. This harm may be intensified when pots are placed in jardinières; in these the surplus water accumulates so that the pot may be standing in several inches of foul water. This can be avoided by frequently emptying the jardinière and it is also a good plan to place an inverted saucer or piece of brick at the bottom so as to prevent the pot from continually standing in water.

While the standing of pots in saucers is necessary in the case of plants placed singly about a room, such saucers being actually harmful to the plants, or the reverse, according to the manner things in connection with them are handled, for a group of plants in a window individual saucers are better done away with and a water-tight zinc tray two inches deep made to fit the position used to stand pots on. Before placing the pots an inch deep of small pebbles should be evenly spread over the

bottom of the tray on which pots can freely drain themselves without standing in water. For the purpose of keeping some moisture in the air it is advisable to always have half an inch of water in the tray. A further advantage is that a tray prevents slopping of water about the floor or table.

Soft, or rain water is the best to use when it can be obtained; in the case of snow it can be gathered and allowed to melt and the resulting water is very good for plants provided it is not given them until it has reached a temperature of forty degrees. It is not considered of any particular advantage to use warm water for plants in Winter, although the question has been frequently discussed by greenhouse men, in fact some large plant growing establishments under glass have been equipped with means of raising the temperature of all the water used; the general consensus of opinion is, however, that there is little, if any, practical benefit derived from the system.

Cleanliness is an important point which makes for success with house plants. It is no more possible for them to thrive and live happily if their bodies are covered with dust and insects than it would be for ourselves. In a dwelling house dust will always accumulate upon them, which fills up the stomata, or what corresponds to pores, in their leaves, which decreases the power of, or absolutely prevents, the leaves from carrying on their functions, which functions are of the utmost importance inasmuch as practically the entire process of digestion is carried on in the leaf; this was set forth somewhat in detail in previous lessons on plant physiology.

Plants with broad foliage may be cleaned by a wet sponge; standing plants in the sink, laundry tub, or bath and spraying them will effect the purpose. Advantage can at this time be taken of the opportunity to scrub the pots, as keeping the outside of them clean helps to ventilate the roots. Also remove all dead leaves.

Insects sometimes appear upon house plants, especially upon those which are not doing well, as these pests generally attack sick plants before they do healthy ones. The almost invisible red spider finds the dry atmosphere of a dwelling house very congenial, and, if present, will multiply with great rapidity; aphids and thrips are other pests likely to give trouble. A frequent shower bath as suggested above will do a great deal to prevent them from making any headway, or of obtaining any foothold at all. If they have been allowed to become numerous spraying with some reliable insecticide, such as Aphine, should be resorted to. In the case of plants with which the method is practicable, the most effective way is to mix sufficient insecticide in a pail or other vessel deep enough so that the entire plant except the pot may be submerged by holding it upside down and moving the plant about so as to be sure the insects are washed off; both hands should be used, one to hold the pot and the other to prevent the ball of the plant from dropping out of it. When scales appear—plants like palms and rubbers being most subject to them—the scale should be loosened with a strong solution of whale oil soap and the plants then sprayed with clear water; a sponge can also be used to wash off the scale.

The common earth worm is sometimes found in pots; it does no harm directly to the plant and does not eat any of the plant's roots as some people think, but it creates conditions in the soil which are inimical to a plant's health inasmuch as it tunnels round and through the ball of earth to such an extent as to reduce the soil to mud; also it will invariably work down into the drainage and render it abortive. The use of lime water will either kill them or cause them to come to the surface when they can be removed. Lime water can be obtained from a druggist, but is easily made by stirring a pound of builder's, or lump, lime into two gallons of water, after settling the clear water on top is ready for use. Using this clear solution at intervals of a month will not harm any plants excepting azaleas, heathers, and others of the same family. If pots containing the latter are troubled with worms they can be drowned by placing the pots in water deep enough to cover the rim for about ten minutes. Mustard water is also effective against worms, and it can be used for any kind of plant, by watering them with a solution made by mixing a teaspoonful of fine mustard thoroughly with one pint of water.

Mention has just been made of worms destroying the pot's drainage, they do this by filling up the spaces between the pieces of broken pot, or "corks," which are placed over the hole to keep a free passage for the water to drain away. Drainage is the most important point connected with plant culture, and if plants are to do well the pots in which they are placed must first be properly "croaked." In a complete sense, croaking a pot can only be taught through an experienced man showing how to do it, but the underlying principle of it is that the corks are so placed that there is a hollow space, or spaces, between the soil and the hole at the bottom of the pot, the corks preventing this hole from becoming filled up; obviously the larger the pot the greater the thickness of corks required. The concave side of the corks should face downward, and over them a layer of charcoal about the size of beans, these not only assist in keeping

the passage for water open but exercise a sweetening effect; also in pots of larger sizes, five inches and over, the corks and charcoal should be covered with sphagnum moss which prevents the soil from being washed into the drainage.

Pots which have been used should be thoroughly cleaned inside and out, as the material of the pot possesses a certain amount of porosity and if clean it absorbs moisture and also allows some air to get to the roots of plants. On account of their deficiency in these respects glazed pots are not desirable to grow plants in.

Trouble with pot plants is frequently caused by using pots too large for the plants, whereby there is more soil than the roots can occupy until perhaps several months have elapsed after potting, during which period the soil becomes sour from frequent watering and the roots refuse to grow freely. The actual size to use will of course depend upon the amount of healthy roots a plant has, but in the case of repotting being necessary on account of the pot a plant is growing in becoming filled with roots, it is usually sufficient to have the new pot not more than one inch larger in diameter, and in many cases the soil may be shaken out of the roots and fresh soil used with a pot of the same size. It is well to delay fresh potting as long as possible and feed the plant with plant food dissolved in the water; there are several kinds of soluble plant foods on the market and those advertised in this journal may be relied upon.

Soil for potting purposes may be obtained from the principal seed houses or from any commercial plant growing establishment. It is also quite easy to prepare it one's self. It should be mainly composed of sweet fibrous loams formed by the decay of turf from a pasture, which has been piled in a heap and turned over once or twice during a period of several months. After chopping up with a spade this should be sifted through a sieve of three-quarters of an inch mesh, the dead, fibrous grass roots being rubbed through the sieve, stones and other useless material being discarded. To this should be added for all ordinary plants about one-third part of leaf mold, that is leaves which have decayed into a powdery form, with the addition of one pound of pure bone meal to half a bushel of the compost; for ferns, the proportion of leaf mold may be increased to one-half or three-quarters. Neither soil from a low, wet situation, nor black humus, should be used for potting purposes, at least not until it has been composted for a year, had lime mixed with it, and turned over several times. For the *Ericaceae* family, to which Rhododendrons and Azaleas belong, and for Ferns, the lime should be left out.

While some species of plants will thrive more or less well when they do not get any, or very little direct sunlight, the first requirement of all plants during their growing season is the greatest possible amount of daylight, in fact the importance of this cannot be over estimated. Curtains should be pulled aside and shades rolled up by sunrise so that the plants in the window may get the first bit of daylight. The more light a plant receives the greater its power of assimilating food, which assimilation is brought about by the action of light upon the leaves. Sunlight is the source of plant energy—as it is of ourselves—and without light the absorption of carbon from the air cannot take place. As about three-fourths of the dry matter of plants is carbon; the whole of which comes from the atmosphere; it follows that a plant cannot thrive unless the conditions are such that it can obtain this carbon.

It does not appear necessary to discuss the merits or demerits of the many kinds of plants which may be grown in a window. Too much importance is sometimes placed on the special needs of different varieties and species, when as a matter of fact, no such needs exist, so long as a good, sweet compost as mentioned above is used for potting.

We have often wondered why so few people have their verandahs so constituted so as to be heated and used as a Winter garden and sun parlor. With something of this kind the possibilities in the way of house plants are wonderfully increased.

A very considerable amount of cheerfulness can be added to a home in the Winter half of the year by using the outside window boxes for evergreens, and also having similar plants in tubs about the piazza and in vestibules. For the window boxes those about a foot or eighteen inches tall are large enough, the most suitable species being the compact varieties of *Thuya occidentalis*, together with *Biota*, *Juniperus* and *Retinispora*. Larger specimens of these may be used for the tubs, as well as Norway and other Spruces. In the severe Winters of the northern states all these will keep a good appearance up to February or early in March, after which those facing the sun will probably deteriorate so as not to be worth keeping over for another year. This deterioration is caused by the fact that the boxes and tubs out of doors will have become frozen solid and the plants have been practically in cold storage and dormant, but as soon as the days lengthen and the sun gains in power sap circulation begins before the soil around the roots is thawed, therefore the foliage cannot get any moisture from the roots to compensate

(Continued on page 812)

Departments of Foreign Exchange and Book Reviews

ROSES AND ROSE GARDENS

THE considerable mansion with abundance of land may have stately terraces and lordly parterres, enclosed gardens of many kinds and wildernesses: the denizen of "Suburbia" must be content with a strip little wider than his house frontage and of no great length. Both, however, may, if they wish, have a rose garden, albeit on very different scales, and who shall say that oft-times the owner of the little garden, with its few rose bushes on which he lavishes personal care, does not get greater enjoyment from his rose garden than the squire of many acres from his more spacious one?

There are many gardeners, many excellent gardeners from one point of view, whose chief joy is in a plant well grown. A rose or a cabbage brought to perfection affords them equal transports of delight, and if the two in their gardens happen to be in juxtaposition it matters very little. Every man to his taste and every garden for its owners. The following notes will not interest such gardeners, so they may turn the page.

In the smallest garden, space may be found for a tiny formal rose garden, though it consist only of four L-shaped beds set in turf, surrounded by a green hedge (for preference) or by a screen of Ramblers. In the centre may be a bird-path or even a small sundial.

Where greater space is at disposal there is necessarily more scope for individual taste and judgment. One may have a garden austere formal in design with perhaps two rows of beds on either side, each of moderate width and divided. Some simple center treatment and pivotal ornament alone redeem the quiet severity of ordered beds, trim lawn and clipped surrounding hedge. This type of design is varied sometimes by surrounding the garden by banks of rose species instead of the deep green hedge. The writer yields place to no one in his admiration of the various wild roses, but he cannot think that this is the best place for them. They have density enough to obscure any solid background placed behind them and not weight enough to form an adequate background in themselves. The same applies even more forcibly to the roses on poles, which so often form a rose garden surround, unless they are backed at a little distance by solid planting. Even then the effect they produce does not appeal like the ordered simplicity and glowing coloring of the type of garden first mentioned.

Formal gardens, whether rose or other, need not, of course, be oblong. They may be square, circular or oval. The square garden is, of course, but a "particular case" of the oblong one, and when of fair size may be made extremely beautiful. Circular and oval rose gardens are, unless some special situation call for them, a mistake. The rose undoubtedly looks best in well proportioned oblong beds *one variety in each bed*. There are, however, cases where circular or, more frequently, oval gardens are the best and easiest solutions of a problem. Imagine a garden on a hillside adapted to fit the moulding of a hollow, either natural or formed incidentally, when excavating stone or gravel. Below this rough shelf the ground falls again to a ravine. Here, then, is a case for an oval garden, and on the banks, above a Yew hedge if possible, for the rose species surround. Sometimes a circular garden may be desirable where, in extensive grounds, vistas cross.

The sunk garden has many admirers, and where space is limited and numbers of separate gardens out of question the rose garden may be formed as a sunk garden. Though this type of garden lacks the simplicity and some of the dignity of the plain rectangular treatment, it has a quaint tidiness which reminds one of a Dutch garden, and this effect can, where desired, be accentuated. Roses are often used for planting a paved garden, but in some way neither the roses nor the paved garden look altogether happy so treated. Dwarf roses, at any rate, have not that mounding, spreading habit so delightful in a paved garden, and the soft greys and browns even of self-faced paving, delightful as they are in themselves, scarcely provide an adequate foil for the pure rich colorings of the rose. Mauve and grey are the colors which especially tone with paving, and they are entirely wanting in the Queen of Flowers.

Happy indeed should be the hillside gardener. Terraces are always charming, and a properly contrived terrace rose garden is delightful. Grass walks should be introduced on every tier, but the arrangement of the beds must needs depend on the width of the terraces. The intervening walls, whether shallow or deep, can be rose-clad. If shallow, the pillar roses will be of service. If taller, Wichuraianas above or Ramblers beneath may be used to drape them. *Drape* them be it noted, not *smother* them. To build

a beautiful stone wall and then entirely hide it, even under charming climbers, is wicked!

So far we have considered rose gardens of ordered formal design, and before passing to more informal treatment it may be well to point out that rectangular gardens may be filled with beds forming sweeping curvilinear lines, the formality of the garden, such as it is, consisting only in the regularity or symmetry induced by quadruplicating the design in each corner of the garden around a central feature. Gardens with straight boundaries it may be well to point out, even when four-sided, are not necessarily rectangular, so that the diamond shaped garden sometimes gets over a difficulty, especially when a long vista strikes the garden boundary, perhaps a road, at an acute angle.

We come now to quite informal rose garden treatments, though it is well to state at once that the ordinary garden bedding rose is not well suited to purely informal treatment. The many rose species and certain more free-growing roses may be arranged informally with splendid effect, especially where a natural hollow can be utilized for the purpose. Where this is wanting, excellent results may be obtained by a little contouring, aided by a judicious arrangement of backgrounds. Where this method is practised great care must be exercised to use only varieties with a graceful habit of growth, and these, leaving aside species of course, will generally be found in the Noisette, Tea, Hybrid Tea and Polyantha classes and in that order. In planning the informal rose garden diverse habits of growth may be used to provide contrast almost more largely than contrasting coloration. In the formal rose garden, on the other hand, care must be taken to avoid the heterogeneous effect produced by alternating tall and dwarf varieties. It is usually better to plant one variety in the beds surrounding a sundial or other central feature, though two varieties may be used of either sharply contrasting or harmonizing coloring, the opposite beds being planted with the same variety. The two varieties thus employed should be as similar as possible in habit of growth and freedom of flowering. A particularly suitable Rose for these central beds, at any rate on light soils, is Lady Hillington, as it is soft, yet noteworthy, in coloring, has good foliage and yet, owing to its slenderness of growth, may be planted fairly thickly. The oblong beds in the central vista of an oval garden should be filled with Dwarf Polyantha Roses. The circular beds in the same garden would be filled with rather dwarf, free-flowering and brightly colored varieties, as it would be desirable to emphasize these beds as far as possible.—*The Garden*.

THE USE AND ABUSE OF CONIFERS

THERE is something distressing about the arrangement of Conifers in many places, particularly in suburban gardens, while the varieties used too often show a lack of imagination on the part of the planters. The most obvious instance which occurs to mind of this last failing is that which relates to the planting of Cedars, Wellingtonias and similar free-growing trees close to the house windows, so that, ultimately, the choice must be made between dwelling in perpetual twilight or sacrificing a beautiful specimen. For a long period before this stage is reached the tree has probably been a disfigurement to the house architecture, dividing into compartments a frontage which any planting should have served to emphasize. With regard to the actual arrangement, "spottiness" is the fault most characteristic and widespread. The rule of planting seems often to be "here a Lawson, there a Lawson," interspersed mainly with deciduous trees and shrubs, with perhaps a specimen *Picea* or two to bear them company. An enquiry as to the *raison d'être* of the "Lawsons"—the gardener's name for the so-called White Cedar, *Cupressus Lawsoniana*, and used here to cover its numerous varieties—usually draws the response that they are to "provide furniture" in Winter! Mas! it is in Winter, when the surrounding planting is destitute of foliage, that their spottiness is so apparent and so appalling. In Summer the effect, though unsatisfying and worrying to a critical eye, is hardly so blatant. When one thinks, however, of what might have been, it fills one with an abiding dissatisfaction.

Each countryside has its characteristic scenery and its equally characteristic vegetation. Trees which succeed, though commonplace, give a far better effect in the garden than choice exotic species or nursery varieties which never look thoroughly at home. The hungry soil seems admirably to suit the Scotch Fir, and in such situations this tree should be freely utilized for backgrounds, contrasted with the equally common, but wonderfully beautiful, Birch. For the rest most conifers succeed, and Cedars, including

the beautiful Blue Atlas variety, and Silver Firs, may be planted where space allows, but the Cedars, especially, should have space to grow into specimen trees.

In richer soils the Lawson Cypress is more at home and may freely be used for backgrounds, especially where these are not desired to be too tall or quick growing, which would be the case with such trees as Douglas Firs.

If the landscape lacks distinction, the sombre majesty of a plantation of Austrian Pines will do much to provide the needful contrast. The species is valuable, too, for garden backgrounds wherever the Scotch Fir does not bulk largely in the landscape. Its solidity makes it an admirable foil for more gracious trees and shrubs, especially for flowering shrubs. It has also distinct and noteworthy value as an avenue tree, associating very well for this purpose with the Lime, the rich yet sombre ruggedness and rather spreading habit of the Pine, and the slender, twiggy pyramids of its deciduous companion in Winter or its pale green leafage in Summer, forming varying but always pleasing contrasts.

The Douglas Fir is now often used for spinneys and plantations and also for backing to shrubberies. Its coloring is very characteristic, and for massed planting is a drawback; also the tree lacks something in density, but the Colorado variety, though distinctly slower in growth, is admirable, if distinct, in coloring, and its density quite satisfactory. Just as a few Poplars will often make distinguished and beautiful a group of planting otherwise humdrum, so a small clump of the typical Douglas Fir will oft-times enliven and add variety in color and outline to an evergreen planting.

For deep, cool soils especially where rain is abundant, the Hemlock Spruces (*Tsuga*) are of great value. Their distinct, finely cut foliage and their general carriage remind one of the Deodar—remind one, but that is all. They are quite distinct.

T. Albertiana forms, as a rule, a shapelier tree than the more commonly seen *T. canadensis*. Equally beautiful and more accommodating as to soil and atmospheric conditions, *T. Pattoniana*, not infrequently met with in gardens under the name *T. Hookeriana*, with bluish grey foliage, is not used as much as it should be.

More common, and so more readily available for massing, is the common Spruce—the "Christmas-tree" of our childhood—and its allied species, *Picea orientalis* and *nigra*. For plantations both the common and black varieties are very beautiful where they succeed, which, contrary to the common impression, is not everywhere. For nearer inspection the Oriental Spruce should be used. It is doubtful if there is any more beautiful conifer than a well grown tree of this species.

Of the *Thuyas*, *gigantea* has already been mentioned. Its principal attractions lie in its rapid growth and columnar habit. It is a lax-growing tree and should be kept in the background. There are a legion of varieties of both *orientalis* and *occidentalis*, many of them quite beautiful, especially in Winter when they put on russet mantles of many shades. The varietal names are not too well established and there are such a numerous family, but they may easily be selected in the nursery. Bearing in mind the warning already given anent the too free use of colored conifers, *Thuya l'evancana* is, on soils on which it retains its color, a beautiful shrub and it has a fine pyramidal habit.

The Pines are, with rare exceptions, too large for use as anything but backgrounds, except in grounds of considerable extent. Noteworthy among the few smaller-growing sorts are *Mughus (montana)* and *Cembra* (Swiss Stone Pine). This last makes beautiful pyramidal specimens of quite slow growth.

Almost all Pines are worth growing where space allows. *P. insignis* (Monterey Pine) is truly remarkable for the quickness of its growth. It must, of course, be established while small as it quickly becomes untransplantable, if so ugly a word may be forgiven. Its lustrous, brilliant green foliage is quite distinct. *P. Coulteri* is relatively slow growing. Its distinguishing feature is its extraordinarily long, rather dull needles—a beautiful species none the less. *Pinus Strobus* (Weymouth Pine) succeeds best near the coast, but *Pinus excelsa*, which is very similar in general appearance, "does" anywhere and has a healthier looking appearance. Both species are too light in color and too thin in growth to form effective backgrounds. The ubiquitous Austrian Pine and the so-called Scotch Fir have already been mentioned.

The Redwoods, *Sequoia sempervirens* and *gigantea* (Wellingtonia) are almost too well known to need mention. The former is of little interest except to the collector, and the latter, like the *Araucaria*, is too Victorian for present day taste and is seldom now planted. It is none the less a fine avenue tree. A cousin to these, the so-called Deciduous Cypress, *Taxodium distichum*, makes a handsome tree, and like that other deciduous conifer, the Larch, is particularly beautiful when first it bursts into leaf in Spring. Informal grouping of Larch in backgrounds of Fir or Spruce should always be arranged where possible. They add a pleasing variety and the pea-green foliage is, for a week or two, extremely gracious.

We have, as already mentioned, touched on the great coniferous families, but in our wanderings we have missed quite a number of species and varieties which now call for mention. *Picea pungens*

glauca used, despite its unpleasant smell, to be a great favorite, but owing to its indiscriminate use as dot plants in suburbia and to its unfortunate liability to attacks of aphids which, if not promptly attended to, destroy the tree, it has fallen in estimation of late. None the less a really good specimen happily placed is a beautiful picture. *Abies concolor* and the somewhat similar *A. Lowiana*, often called *lasiocarpa* in gardens, have already been mentioned, but a well colored form of either is as beautiful an object as one could well wish to see. The distinctness of each deep green whorl of branches and its wonderful symmetry mark a well grown specimen of *A. Nordmanniana*, while the equally rigid but longer needled and more glaucous whorls of *A. nobilis* have a dignity all their own. Very remarkable are the large loosely strung cones of this species which at a little distance look like wise young owls sitting in the topmost branches.

No definite rules can be laid down for the arrangement of the many species and varieties thus roughly outlined, but if care is taken to prevent "spottiness" by using conifers as a continuous background, which is allowed here and there to, as it were, break through the lighter deciduous planting in front and to arrange them with a sufficiency of contrasts, remembering that there is a contrast of habit as well as of color, the arrangement should be a success. Care will naturally be taken to see that each tree serves some definite purpose in the garden picture—that it is not being put there merely because it is a rare specimen—and that each valued tree has room to grow and is in a suitable soil and situation. It is easy to fill in shrubs for temporary planting which can subsequently be removed or cut away.

If Larch be used for this purpose, their timber, when ultimately their room becomes preferable to their company, will, at the least, be useful for stakes or rails. For the fronts of shrubberies short-lived plants such as Brooms can, when their time comes, be removed without regret.—*The Garden*.

BOOK DEPARTMENT

The Drama of the Forests, by Arthur Heming. Doubleday, Page and Co., New York.

This book should be found very fascinating by any one appreciative of Nature altogether untamed. For the trampler or the camper, the hunter or the student of animal life, the artist or the keeper of a zoological park it offers the results of careful and first-hand observations and experiences in company with the craftiest, shrewdest and wisest trappers, most of them Indians, "the children of the forest." The human characters all are indeed most entertaining and profitable for study; they prove Emerson's words, quoted by the author: "In the woods we return to reason and faith."

It was daring to attempt to weave into one continuous narrative, as though all had happened in a single year, the most interesting facts and information gathered from thirty-three years; but the attempt has been unqualifiedly successful. Delicious piquancy has been imparted by a little dash of romance that is never obtrusive and by the incorporation of several wild animal stories. Evident truthfulness and the entire absence of imaginative fiction in connection with themes that give tempting and abundant scope for them are gratifying in these days when story-tellers present quite misleading conceptions of the pure and usually simple and safe life of the wilderness.

Because of the scenes, the Canadian woods in the hunting season, the volume has little interest for the lover of flowers or the gardener as only a gardener; but the author is an artist and it was his profession that led him into the regions he portrays. The descriptions of color, both verbal and pictorial, for the book contains thirteen two-color plates, are suggestive and instructive.

THE WINDOW GARDEN IN WINTER

(Continued from page 810)

for the evaporation caused by the warm sun, and they soon begin to turn brown and fall off. Those on the sunless side of the house will not be affected in the same way and will generally come through all right. In the case of the tubs, they may be easily taken into the coolest part of the cellar now and then during the Winter to allow the soil to thaw out, after which they may be well watered and put back, by this means they can be kept in good condition and used for several years.

DO you find the columns of the Gardeners' Chronicle interesting? Certainly you do, or you would not be perusing them. Your gardening neighbor, were he familiar with them, would become equally interested. Why not recommend the Gardeners' Chronicle to him as a guide to his garden work? He would appreciate it—and so would we.

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Boston, Mass.: Robert Cameron, chairman.

THE NEW ENGLAND CONFERENCE

A conference was held under the auspices of the members of the association residing in Boston and vicinity on November 30 in Horticultural Hall, Boston. Due to the severe ice storm which swept over the outskirts of that city a day or two before, which did tremendous damage by the heavy fall of ice, some of the finest trees being destroyed, and traffic made difficult, the attendance at the meeting was not as large as was anticipated. Nevertheless it was an enthusiastic gathering.

It was voted to organize a local branch of the association in that vicinity.

The annual convention, which will be held in Boston in 1922, received considerable discussion, with the consensus of opinion that September 15 would be about the best time of the year to hold this convention of four days duration, two days for business and two for sight-seeing trips. One of the trips will be to some of the large estates along the North Shore, and a clambake on the shores of Castle Hill Farm, of which Robert Cameron is superintendent.

Many of the members present pledged themselves to work hard this coming year with the intent to increase the membership mate-

rially and to make the next convention a banner one of the association.

PROTESTS AGAINST BILLBOARDS

Additional protests against the use of signboards continue to come in to the secretary's office.

From a member in Maine a letter has been received telling of the vigorous protest that is being made against the increasing number of billboards along the State highway. The protest of one of the citizens of Portland was enclosed, and the secretary has been asked to reply to it so that attention may be drawn in Maine towards our campaign against the signboard nuisance.

A clipping was also received at the office telling of the effect which was produced on Yakima Indians by a cigarette signboard erected across their sacred "painted rocks." "On learning of the desecration, nearly a hundred young braves mounted ponies, and galloped to Wapato, Washington, where they insisted upon searching the train for the sign painters. Finding their way blocked they rode back to the reservation and washed off the offending advertisement with turpentine. This sign was to have been equipped with electric lights and would have been visible for twelve miles. Deep in the crevices of the 'painted rocks' are indentations of images of men, buffaloes, trees and hieroglyphics, which are believed by the Yakimas to be of divine origin."

If any member of the association learns of endeavors to abate this nuisance, the association would be glad to have him communicate with the headquarters, so that the campaign of the association may be extended.

ROBERT WILLIAMSON

It is with deep regret that we are called upon to announce to the gardening fraternity the death of Robert Williamson, which occurred suddenly on December 12.

Mr. Williamson was born in Aberdeen, Scotland, Aug. 8, 1860, the youngest son of Gordon Williamson, who was gardener for Lord Turner. As a young man he worked at Pife Castle. Coming to this country at the age of twenty-one, he worked at Harvard University, and then went to Profile Gardens, Franconia, N. H. In 1887 he left there and went to "Milbank," Greenwich, Conn., which was the estate of the late Mrs. Elizabeth Milbank Anderson. Of this estate he was superintendent and general manager, both in horticulture and agriculture since 1887. Under his direction "Milbank" has seen many changes.

Mr. Williamson was regarded as a horticulturist who had few equals, and was a very successful exhibitor at many shows. He was an active member of the Westchester and Fairfield Horticultural Society and a member and director of the National Association of Gardeners, in which he took an active interest. He is survived by his wife and son, Robert Williamson, and a brother in Sydney, Australia.

NEW MEMBERS

The following new members have been added to our membership lists: George Mustoe, New York City; William Reeves, Somerville, N. J.; M. C. Redlich, Larchmont, N. Y.; John Tait, Waltham, Mass.; Max Aubertel, Stamford, Conn.; John Garland, Wellesley Hills, Mass.; Edward Young Chesney, White Plains, N. Y.

AMONG THE GARDENERS

Mr. and Mrs. William E. Marshall have announced the marriage of their daughter Mildred Lucie to Levon Murachanian. The wedding ceremony took place at St. John's Episcopal Church, West Hoboken, N. J., on the evening of Wednesday, the 7th of December.

Hugh Davidson accepted the position of superintendent on the estate of J. S. Pillsbury, Crystal Lake, Minnesota.

James Linane secured the position of superintendent on the Walter C. Teagle estate, East Portchester, Conn.

Robert L. Chalmers has secured the position of superintendent of the H. R. Winthrop estate, Woodbury, L. I.

William Cottrell secured the position of gardener to Hamilton Park, Purchase, N. Y.

William Atkinson accepted the position of gardener on the G. Gunby Jordan estate, Columbus, Ga.

Charles F. Twiss secured the position of manager of the Llewellyn Lodge Farm, Bedford, Mass.

LOCAL SOCIETIES

WESTCHESTER AND FAIRFIELD HORT. SOC.

The November meeting of the above society was well attended, many of our members coming from a distance to take part in the nomination of officers and to see the exhibition of Chrysanthemums staged at this meeting.

Big blooms were not shown to any great extent but there were well filled classes in singles and pom poms. There was a good collection of material staged for the monthly prizes but the outstanding exhibit was a vase of singles, Mildred Pesby, shown by Thomas Ryan. This is a delightful shade of salmon pink and seems far superior in form-habit to the majority of singles. It undoubtedly was the best vase of singles we have seen shown here and deserved the first and cultural certificate that it was awarded.

It is to be hoped that next year we will get back to the good old times and a good big exhibition like the ones held in the past. N. W. Popp gave us a short talk on horticultural activities throughout the country and assured us that things were improving in our line of business.

At question time one member asked the best remedy for the leaf curl on Antirrhinums and was rewarded by the answer that an occasional dusting with soot controlled it. I make note of this because many are of the opinion that black leaf forty is the only thing to rely on which is far from satisfactory.

Members are requested to watch for another change regarding our meeting place as the one we had just secured on Lewis street has been totally destroyed by fire.

GEORGE HEWITT, Cor. Secy.

ST. LOUIS ASSOCIATION OF GARDENERS

The November meeting of the association was devoted to discussions on the convention of the National Association of Gardeners. President Pring presented a full report of the proceedings of the convention and related in detail his observation of private places during and after the convention trip. Mr. Baxter supplemented these remarks by relating his personal observations. This caused a very lively discussion and an increased interest in the affairs of the National Association among the members present.

The December meeting of the association was held at the Forest Park Greenhouses on December 7.

The following officers were elected for 1922:

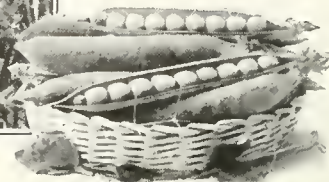
President, Geo. H. Pring.
Secretary, Hugo M. Schaff.
Treasurer, Ernest Strehle.
Corresponding Secretary, L. P. Jensen.
Vice-Presidents: John Moritz, S. M. Beer, John Johnson, A. Lindahl.

A resolution was passed, to assist and support the St. Louis Flower Show Association in their effort to hold a Fall flower show in October, 1922. It was also decided that the association offer a special prize for this show.

The balance of the evening was given to a discussion on the growing of chrysanthemums, indoors and out, which was led by John Moritz and proved to be of unusual interest, many of those present advancing their views on the various phases of this interesting subject.

S. P. JENSEN., Cor. Secy.

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SULPHUR AS A GROWING AGENT

Horticulturists, in experimenting to ascertain the respective merits of nitrate of soda and sulphate of ammonia, have decided that, while nitrate is a bit quicker in action, sulphate lasts a little longer and is more steady in its action.

There is a difference, however, between experiments conducted in a flower pot, and practical work in the garden. I have experimented a good deal in the garden with both forms of nitrogen, and, offhand, I have never been able to discover any difference in the results. As a matter of fact, I have had far better results with rain water leached through a barrel of manure than with either. I have used nitrate upon my tomatoes until all the lower leaves dropped off, and I have had the same results from a too liberal application of sulphate. However, nitrate runs pretty evenly around 16 per cent of clear nitrogen, while there is a considerable variance of nitrogen content in different samples of sulphate. Counting the high price of nitrogen, this should be the balancing factor, so far as the nitrogen content is concerned.

But another agent, recently considered, has considerable influence, and that is sulphur. It recently has been found that sulphur is a strong factor in the growth of some plants. I believe that it is an important factor in the growth of nearly, if not all plants, although I cannot explain its influence. Now, sulphate of ammonia has a considerable percentage of sulphur in what appears to be a readily available form.

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If this idea is correct, it would seem that the sulphate has a double advantage. However, it is a question worthy of future study.

But I am strongly of the opinion that we are spending too much money for commercial fertilizer. We think that we must use an immense amount of nitrogen. And so we must; but we have it in the air, and the growing of legumes will bring it to us without costing a cent, not even for transportation. We think that we must have immense quantities of phosphorus and potash. True; but we have it in most soils, though locked in various combinations. The growing of the buckwheats will set those elements free and make them available for gardening purposes. It is a little longer way around the fertility question, but I am fully of the opinion that the next generation of farmers will look to cover crops instead of commercial preparations as the main source of fertility.—*Market Growers' Journal*.

THE CERIMAN

Monstera deliciosa, commonly called ceriman, is a climber native of Mexico and Guatemala. It attaches itself to trees by numerous tenacious roots, and as it climbs sends out long, rope-like, aerial roots which sometimes reach the ground. The stems are thick, woody, and dark green in color. In the young stage the leaves resemble those of the genus *Philodendron*, being small, entire, and pinnate, but later they become conspicuously large and perforated. The flowers are very striking, in shape suggesting the calla lily, with spathe and spadix white. After pollination the spathe changes from white to green, then to brown, and eventually it drops off, the edible seeds being developed in the cylindrical spadix. When ripe the fruit resembles a pine cone and often measures a foot in length. The outer covering is composed of a series of hexagonal green plates which later fall off, exposing the slightly albuminous yellow seeds. These seeds are very delicious, with a flavor resembling both pineapple and banana and an odor strikingly like the pineapple. Twelve months must elapse between the expanding of the flower and the ripening of the fruit.

The ceriman grows satisfactorily in both cool and tropical greenhouses, and, due to its ability to endure varied conditions of temperature, young plants may be grown as pot plants in the house. To obtain fruiting specimens, however, the plants must be grown in a tropical greenhouse and planted directly in the ground adjacent to a wall upon which they may attach themselves. Like most araceous plants they require an abundance of moisture upon the leaves and roots. The plants may be propagated from the terminal growth or by cutting up the old stem, each node possessing a dormant eye. The cuttings are placed in moss with bottom heat and when new roots appear from the under portion of the stem they should be potted into small pots in a sandy loam soil.

Fruiting specimens of the ceriman in various stages may be seen at the Garden, the older plants attracting much attention on account of the size and perforations of the leaves. Several plants showing both aerial and supporting roots may be observed climbing upon the concrete wall on the north side of the aroid house. In the fern house a specimen is growing from the grotto adjacent to the waterfall, an excellent view of combined foliage, flowers, and fruit being obtained upon entering the south door. In the palm house specimens are planted at the base of the large iron girders upon which the plants are climbing.—*Missouri Botanical Garden Bulletin*.

WHITE ANTS IN GREENHOUSES

A Brooklyn subscriber recently sent us some small insects which proved to be termites or white ants. These insects were causing much trouble by boring into and destroying Poinsettias.

To us they were something new in the greenhouse pest line, but from a bulletin published by the Department of Agriculture we learn that the white ant is not at all particular where it locates itself, so long as wood and moisture are available. It is essentially a wood pest and where wood benches or wood in any form is used in the greenhouse it may take up quarters and prove a general nuisance.

The foundations of houses are most liable to attack, but when the timbers are kept dry and well saturated with creosote, it is more or less immune to attack.

The white ant colonizes like the true ant, but lives in wood which is in contact with or closely adjacent to moist soil.

At times the pests will attack live trees and orchards, while greenhouses containing beds or benches of heavily manured soil are always liable to attract the termites. To fight the pest after it establishes itself in a greenhouse, is no easy task, especially if they get into the woodwork of benches. Their main location must be sought out and boiling water, kerosene or carbolic acid must be used.

Bisulphide of carbon is also recommended for impregnating soil around infested centers. Where stone or concrete walls adjoin woodwork, one must always look out for the shelter tubes which the ants build over impenetrable surfaces to make a connection. The white ant dislikes the open light and therefore builds peculiar dirt tunnels on the surface of stonework, through which it travels from point to point.

Colonies in woodwork, if shut off from moisture supplies, will die out, that is to say, posts containing termites if severed from contact with the ground will cease to support the colony, as the pests cannot live without moisture. The fact that some of the ants have wings make it essential for a close watch being kept, as these flying swarms start new colonies elsewhere.—*Florists' Exchange*.

THE CYMBIDIUMS

There are about 50 species included in the genus *Cymbidium*. Most of the varieties in cultivation come from tropical Asia, a few from Africa and Australia. The plants have beautiful foliage and contrary to most orchids are quite decorative even when out of flower. The flowers are borne on long upright stems numbering from 5 to 30 according to variety. One of the most remarkable things about this wonderful genus is the length of time the flowers will remain fresh either on the plant or cut, thus they make an ideal florists' flower. The hybrids that have been derived through artificial hybridization number some 30 or 40 varieties and contain some of the most beautiful combinations both in form and colors. *Cymbidium insignis Sanderi*, the beautiful pink variety introduced by Sander and Sons of St. Albans, England, some fourteen years ago and found by their collector growing at an elevation of 5,000 feet above sea level, in the mountain ranges in northern India, has been used extensively as a parent in hybridizing, the hybrids derived from this particular species are among the finest in cultivation.

The cultivation of this unusual species is very easy compared to some other varieties of Orchids, providing a few fundamentals are observed. The plants should never be

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Madison Cooper, Publisher, Calicut, N. Y.

allowed to become dry at the roots, more water must naturally be given when the plants are growing than when they have completed their growth. Compost should consist of one third *Osmunda* fibre, one third sphagnum moss, and one third turfy loam. Temperature 55 degrees for species, with a rise of 10 per cent by day, with a 5 per cent higher temperature for all hybrids. Air should be freely admitted on all favorable occasions.

It is my firm belief that the *Cymbidium* is one of the coming flowers and will be grown generally wherever the public demand a flower that is beautiful, an extraordinary keeper and shipper, and a plant that is easy to grow.—*Horticulture*.

NASTURTIUMS IN THE VEGETABLE GARDEN

At present the Nasturtium is regarded solely as ornamental and is rarely found outside the realm of the flower garden. Yet I can remember when it was considered an important adjunct to the vegetable garden, and no home garden was complete without a bed of it. Just why or how it has lost its prestige in this respect I am unable to say; for it is easily cultivated and every part, including root, stem, foliage, flower and seed, is edible. Though perhaps possessing no great nutritive value, its foliage makes, in combination with other plants, one of the tastiest of raw salads, and imparts a characteristic and delicious flavor to various potherbs, while its seeds form a valuable ingredient of so-called mixed pickles.

Florists recognize several hundred varieties of nasturtiums, and the number is constantly increasing, for they cross readily among themselves. Few generations are required to stabilize a new variety. The plants vary in height from a few inches to 20 feet, but the larger varieties are best. I believe that Madame Ginter is best of all for the vegetable grower, though Jupiter is a close second. For best results these varieties should be planted singly, six or eight inches apart, and trained over a trellis or similar support. When grown for the beauty of the flowers alone, it is better to plant on a dry, sterile soil, but the reverse is true when they are grown as a salad plant.

When used as a salad, the foliage is usually combined with lettuce and served similarly to cress or peppergrass. When used as a potherb, it is more commonly cooked with some plant of a less pronounced or less pungent flavor, like spinach or chard. If the foliage is used for pickles, it is partially cooked, sometimes by itself and sometimes in various combinations, then drained, packed in jars, and boiling vinegar, heavily spiced, is poured over them. The flowers, though of good flavor, are rarely used, since, by their color, they impart an untidy appearance to the product.

If the seeds are wanted for pickles, they are gathered as soon as ripe and before the outer shell has become hard and woody. Vinegar is poured over them and they are allowed to stand three or four days. Then the vinegar is drained off, and finely chopped horseradish and other spices, including cinnamon and cloves, are added with sugar to suit the taste. The seeds are placed in jars, the vinegar is brought to a boil and poured over them, and the covers tightly fitted to retain the aroma.

Try some of your customers with a free sample of nasturtium in some form next season, and see how soon you will work up good trade.—*Market Growers' Journal*.

GROWING PERENNIAL PHLOX

To grow perennial Phlox to perfection the ground should be deeply dug and well manured, and the plants should be set away from buildings or shrubs. They also need an abundance of water when growing. If growing for single plants, a hole may be dug two feet wide. Soil from the first spade in depth should be placed one side. Then throw in a good layer of rotted stable manure or pulverized sheep fertilizer and dig this in another spade in depth, chopping it up fine. Put some of the top soil back and place the plant on that, covering with the remaining soil. Water thoroughly and mulch with manure.

It is a good plan in the Spring of the year, if manure is not obtainable, to sow oats or spinach around the plant and when about six inches high cut it with a hoe and leave it on the ground around the plants to form a mulch.

If growing in large quantities a furrow may be plowed and after spreading some manure in the trench a sharp pointed cultivator can be run up and down the trench as a subsoiler to mix the manure with the subsoil. Then turn the soil back into the trench and set the plants.

The finest phlox I have ever seen in America were in a beautiful old-fashioned garden at Lancaster, N. Y., with flowers 1½ inches across and large beautiful spikes. These were well mulched and could be watered when necessary. They were a glorious sight, especially during such a dry season as we have just experienced.—*Flower Grower*.

THE GARDEN BEAUTIFUL

In the garden here at Fall time

Nestled 'twixt the big grey walls

Where the dahlias come a'creeping

Up through laughter out of weeping

To no tryst of mortal keeping.

'Tis the Garden Beautiful that calls.

And the roses' fragrance drifting

Sows a nameless sweet unrest—

Sets the prisoned fancy faring

Wakes a flame in hearts uncaring

With a net of perfume snaring

All who love dream blossoms best.

But if any have attained it

None has ever yet confessed

All the asters that abound there

And the flowers that are found there

And the yearnings that are crowned there

In fulfilment of the quest.

Ah the hearts that you have gladdened

Sweet wafting rainbows of the air

Nature's hues of light reflected

God sent omens to dejected

Prisoned men you have corrected

Garden Beautiful everywhere.

—*Exchange*.

I pity no man because he has to work. If he is worth his salt, he will work. I envy the man who has a work worth doing, and does it well. There never has been devised, and there never will be devised, any law which will enable a man to succeed save by the exercise of those qualities which have always been the prerequisites of success—the qualities of hard work, of keen intelligence, of unflinching will.—*Theodore Roosevelt*.

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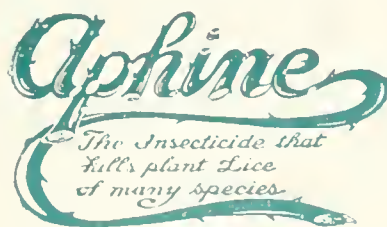
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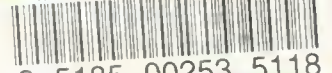


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