The Green Thumb

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COLORADO FORESTRY
AND HORTICULTURE

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Pasque Flowers
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"To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit."

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PRESIDENT'S REPORT
Given at the Annual Meeting February 24, 1945

On behalf of the Board of Directors and the officers of the Colorado Forestry and Horticulture Association, I welcome you to this Annual Meeting; the first since the reorganization of the Association, and the 61st, since the organization of its predecessor, The Colorado Forestry Association. Sixty-one years is a long time. I doubt if there are many groups in Colorado with such a long record of sustained effort. The objectives of the Association, "To preserve the natural beauty of Colorado; to protect the forests; to encourage proper maintenance and additional planting of trees, shrubs and gardens; to make available correct information regarding forestry, horticultural practices and plants best suited to the climate; and to coordinate the knowledge and experience of foresters, horticulturists and gardeners for their mutual benefit," are worthy of great and continued effort into the future.

The year just closing has been one of activity and progress. Not less frequently than bi-monthly we have published and distributed to our members the official bulletin of the Association which we have called the "Green Thumb". It is our medium of contact between our board of directors, our officers, committees and our membership. Many interesting and instructive articles have been contributed by our members, all in furtherance of our stated objectives. The Lilac number was particularly outstanding, and has received wide praise, not only in Colorado, but in many states. Mr. George Kelly, our able editor, has made the bulletin a success beyond our most optimistic expectations, and the Association owes to him a great debt of gratitude for his contribution of time and untiring effort. He has been ably supported by Mrs. Paul Hadley, our assistant editor, and the members of the publication committee. To meet the cost of printing and distributing the Green Thumb it became imperative to increase our income from the membership dues. The lilac Christmas present number brought in many memberships. Mrs. Earl Davis, chairman, and others of the membership committee, ably and enthusiastically assisted by Mrs. Helen K. Fowler, have increased our membership from approximately 100 to over 1,000. We are most gratified for the interest which has been shown by the response of so many, and we will endeavor to make the bulletin, which goes to all members, of increasing value and interest.

For some time a severe infestation of scale on the American Elms throughout Denver has been apparent. Last fall the Association undertook a survey of its degree and extent. The attention of the public was called to the findings of the committee, by articles published in the Green Thumb, and in daily newspapers, urging need of trimming and spraying. It is certain that many beautiful elms have been saved that would otherwise have been destroyed. The Association gratefully acknowledges the cooperation in this effort by Mayor Stapleton, Manager of Parks Cranmer, City Forester Bixby, State Forester Ford, the United States Forest Service and the State Agricultural College at Fort Collins.

A proposal for the establishment of an Arboretum and Botanical Garden in Denver was urged upon the city authorities. The matter is uppermost in our minds and we hope it may become a reality in the not too distant future.

For sometime the need of centralized attention to detail of our expanding activities has been apparent, at least on a part time basis, with regular office hours. We feel very fortunate that Mr. Leonard Shoemaker, formerly with the United States Forest Service, has consented to become our Treasurer and Assistant Secretary, and will give us this necessary and regular time. Through the courtesy of Mr. Irvin J. McCarry, office space has been made available for our headquarters at 1608 Broadway. Mr. Shoemaker will be at this office Mondays, Wednesdays and Fridays from 11 A.M. until 2 P.M. All communications may be sent to him. He will keep the membership records, handle receipts and disbursements and assist Mr. Kelly in the business details of publishing the Green Thumb.

From the bulletin you are familiar with the names of the chairmen and members of our various committees. From time to time their reports will be published in the bulletin.

I want to thank our officers, the members of the board, the chairmen and members of committees for their enthusiastic work and fine cooperation which has made this year of accomplishment possible.

Respectfully submitted,
GLADYS C. EVANS (Mrs. John Evans)
President.
FOOLPROOF PERENNIALS  
BY KATHLEEN MARRIAGE

There need be no home garden without its fruit in some form in any of the agricultural areas of Colorado, and such possibilities also venture rather far up into our mountain valleys. Moisture to supplement natural rainfall is a sustaining requirement, whether from stream diversion, garden hose, or dryland windmill. Most all fruits prefer to stand with their roots out of water: thus soil drainage is also a factor of the other extreme.

The areas surrounding the lower Colorado and Gunnison valleys in Western Colorado support the best assortment of fruit varieties in the state, and there peaches, apricots, sweet cherries, and even some vinifera grapes are a reality to commercial proportions. On the Eastern Slope, a more exacting climate moderates our choice, but we still have our staple fruits adapted to the central plains and in addition no one can deny us a venture in experimenting with the marginal tree fruits.

Native fruits, unfortunately, are not congruous with domestic or commercial conception of fruit. Although the chokecherry, wild plum, wild strawberry and raspberries, and Buffalo Berry are some natives that cannot be altogether ignored. Substantially all fruits planted in Colorado are an epitome of North American, European, and Asiatic ancestry. Our early settlers instituted the first experiment plot in the wide open spaces of the west, and from them, we derived the trend of adapted fruits. Academic refinement has later been applied to further horticultural experimentation with systematic collections of varieties for testing, and with scientific plant breeding. Plant genetics in skilled hands holds the key to alluring future discovery of better qualities of fruits blended with greater hardness and adaptability.

Since most contradiction to degree of latitude lies in our Eastern Slope and Plains country, comments herewith will have a mile high viewpoint: looking from the mountains eastward. It is not the intention to enumerate local exceptions in parts of Colorado, but those varieties mentioned are characteristic of the respective cultivated species, and in most cases are suggested for planting in the areas.

APPLES: Crabapples as the class are the hardest of tree fruits outside of the native plum. Among the fine jelly varieties are the highly colored crimson Dolgo, Pink Lady, and Harry Laque. Siberian, Shields, Hyslop, and others. Whitney Crab is practically a small apple, and its crisp, juicy, sweet flavor in August is excellent. Summer apples maturing in July and August include Yellow Transparent, Red Astrachan, Duchess, Anoka. Early Harvest, and tasty Red Chief. Fall varieties are headed by Wealthy, a fine all-purpose apple that has a long season of use directly from the tree, and also has keeping quality for a few weeks after picking. Most of above list should, with moderately late season, be grown and bloom well in our region if given adequate care. Fall varieties include the murders by budding or grafting the desired variety on the scaffold branches or trunk of a very thrifty tree, particularly crabapple. Sunscald of trunks is thus practically eliminated, and it seems the whole tree is tempered by the circulation of sap through the cells of the hardy trunk. Gradually finding its place here, McIntosh and its offspring Cortland should definitely be accepted among first-choice varieties for fine flavor and aroma, and stability of growth: also commended is the late keeping Harison from Minnesota. Dwarf apple trees have an appeal for diminutive size and early bearing: however, the Malling dwarfing root stock is susceptible to chlorosis in our alkaline soils, and a shallow root habit anchors them lightly against strong gusts of wind. The “One-Tree-Apple-Orchard”, also popularized as “Quintuplet” apple is more likely to be a practical means of saving space on the small property, since it has a sturdier root structure. As many as five and six standard varieties are top-grafted on the trunk or branches of a single tree. A hardy, thrifty crab is the best type of supporting tree.

CHERRIES: By tree population, the tart cherry varieties rate first for Eastern Colorado, with ranking commercial production, especially in the northern part of the state. Montmorency is the ideal red pie cherry, with large size, and a pit that is readily removed; Early Richmond is another well known red variety, preceding Montmorency about ten days. English Morello, and a Morello strain known as Wagg often ripen early in August, with fine large fruit having dark red to black skin and red flesh. The Morello is noted for early very heavy yields on trees that do not

(Continued on page 23)
How many entirely different plants are known in different parts of the world as Bouncing Bet, Bachelor's Button, Snow on the Mountain? Technical terms may seem so much hi-fiaultin' jargon but they do convey a precision of meaning impossible in more familiar language, and they have the advantage of being universal—"angustifolia" conveys the impression 'narrow-leafed' to a gardener whether he gardens in Tasmania, Turkey or Texas.

But we're wandering from that easy garden. Among the above perennials may be planted generously self groups of Tulips, Narcissus, Crocus, Snowdrops and Scillas (just try to get them!) as well as a few groups of sure-fire lilies, especially such seven-inch-deep varieties as Regal and Tiger.

Most of these bulbs are found in their native home growing through a ground cover of herbaceous or of shrubbery plants and they enjoy just such company in the garden.

One satisfactory and easy method is to plant—you may fifty tulips of Ellen Willmott and spang on top of them a group of Campanula carpatica or a few dozen Narcissus King Alfred with a surface of Plumbago (ceratostigma) larpentae. As well as comfort, and protection from the sun, for bulbs this arrangement provides an increasing foliage growth to help hide the fading foliage of bulbs for year after year performance with no attention except necessary water.

Cottage tulips seem to be more tenacious than Darwin's. Like all perennials it is probable that their long-lasting depends largely on deep rich preparation of the ground. A store of food underground to provide three meals a day is a paying provision for plants too.

Some of the thirty or more replies to the recent questionnaire, only five people reported experience with more than six kinds, while the total number mentioned was 32. Some Clematis, especially the large-flowered kinds, are rather fussy; but there are kinds which are very easy to raise, and even the most difficult respond to proper treatment.

The genus Clematis includes plants in a wide variety of habits, sizes, colors and hardiness. Some can be used to cover fences and lattice work, some are suitable for perennial borders and others are valuable chiefly for their masses of large bright flowers. The foliage of all is attractive and the plumpy seed-heads of some are as attractive as the blossoms.

Most clematis prefer a loose, well-drained, moist, rich soil. They appreciate having their roots shaded, but their tops in full sun. Planting them at the north of a low wall or a group of shallow-rooted perennials is a good place. The climbers need a firm support, and a pergola, lattice or gateway usually affords the requirements of shade for the roots, and sun and support for the tops. It will pay to provide a good root-run for them by working up the soil for 18 inches deep and wide, mixing well-rotted manure, peat, leafmold or sand with the soil as needed.

Spring is usually the best time to plant in this country. If potted plants are used they should be set in this spot of prepared soil so that the crown will be about two inches below the surface when the ground is settled. If bare-root plants are furnished, a good plan is to make a mound of soil in the center of the hole to spread to roots over, keeping the crown two inches below the surface. A mulch of peat, leafmold or well-rotted manure will help to keep the soil cool and moist in summer, and a good mulch of these materials in fall will benefit the plant over winter. Well-drained soil is essential for Clematis.

To simplify our summary of the species and varieties of Clematis reported on, we will divide them into four classes. These are not strictly botanical divisions, but are based on the characteristics readily recognized by the amateur gardener. These classes will be: 1. Small-flowered climbers; 2. Medium-flowered climbers; 3. Large-flowered climbers; and 4. Low, herbaceous plants.

The best-known in the first class is the Sweet Autumn Clematis, C. paniculata. This was reported on favorably by 19 people over the state. It is covered with a mass of small white, fragrant flowers in September. It usually kills back part way each winter but makes a good growth by blooming time the next fall. It is a native of Japan. Our native C. ligusticifolia is similar in flower, but blooms in the spring and is not fragrant. It is more hardy and vigorous in growth, being easily naturalized where it can climb over fences, stumps, rocks and small trees. Its white, fuzzy seed-heads are very attractive all summer and fall.

Another variety similar to the two above, but native to the Eastern states is the C. virginiana. It will grow here but has no particular advantage over the first two.

The next three in this class are all worthy of much greater use. They are not so rampant in growth or free-flowering, but have a grace and beauty which will be much appreciated. The Scarlet Clematis, C. texensis, (C. coccinea) has urn-shaped flowers which are a brilliant scarlet outside with a touch of pink in the throat which never opens wide. There will usually be a few blooms all summer.

The curly Clematis, C. crispa, is of a similar delicate habit of growth, but bears bell-shaped purple blooms. These two are native of Texas.

The best yellow, small-flowered Clematis is C. tangutica obtusangularia, from Mongolia. It is really a beautiful thing in spite of its name. It is of more vigorous growth than the two preceding, and is at times a mass of yellow and later a mass of white plumes. It seems to be happy anywhere, and seeds itself readily.

Two other yellow kinds have been reported, but little is known of their habits. They are C. serratifolia from Korea, and C. orientalis from the Himalayas. C. jousiniana, with small...
Duchess of Edinburgh, double white, is of the C. florida strain which blooms only on old wood, so was reported as a failure here.

Of the herbaceous non-climbing kinds, most people were familiar with C. recta. This grows about two feet tall and has small white star-like flowers. It is grown in the perennial border and used for cut flowers. C. recta grandiflora has larger flowers. C. integrifolia is somewhat similar in habit of growth, but has blue unshaped flowers. These are easily raised and bloom from June to August. C. heracleifolia var. davi diana, bears tubular blue flowers in August and September.

C. douglasi is a native of our foothills, forming a compact low plant and is full of tubular purple flowers in June similar to those of C. crispa. C. fremonti is from Missouri and has bell-shaped purple flowers to the above. Another native, C. scotti, is sometimes referred to as a variety of C. douglasi. Mrs. Robert Bryden is a hybrid which grows more vigorously than the preceding and has masses of small light blue flowers.

The survey indicates that much more experimentation is warranted with Clematis in Colorado, and that at least twice the kinds could well be used here if given proper care. For instance, so far as I can determine, although there have been thousands of hybrids of various kinds from other regions, nothing has been done towards creating new kinds by hybridizing with our native clematis. This is another job for our Rocky Mountain Arboretum, when we get it.

For more about clematis, I refer you to Bailey’s Cyclopedia of Horticulture, or the July, 1937, number of the Bulletin of Popular Information from Arnold Arboretum, or send for the beautifully illustrated circulars of James I. George & Son, of Fairport, N. Y., Clematis specialists.

GEORGE W. KELLY.
This first Fair was a great success, if we may believe the newspaper description, which exulted that “the size and quantity of our vegetables are wonderful to recent arrivals in Colorado. Turnips as big as pumpkins and weighing over fifteen pounds, together with beets that beat all creation... Corn raised on the highlands, 11 feet in height and ripe enough to defy the grasshoppers.”

Though, at this distance from those early days, travelling sounds to us more like a chore than a pleasure, they did get around and in 1873 we find Mr. Byers attending the Agricultural Congress in Indianapolis, along with the delegates from 24 other states. He was then a member of the Committee on Public Lands.

In 1880, there were enthusiasts ready to undertake the founding of a Horticultural Society. Mr. D. S. Grimes was one of the leading spirits in its organization and became the first president, receiving seven votes, five more than Mr. Byers had. Perhaps the “sensible talk on the subject of fruit growing and its promotion”, which he made at the meeting, raised his stock the extra five points. An editorial of that time urged that it was the duty of every man who had the welfare of his state at heart to contribute his mite to the success of the Society. It was decided that some subject of general interest to the farmers would be discussed at each meeting. The fact that the subject chosen for the first meeting was irrigation shows how vital it was to every one of them.

The Horticultural Society staged its first exhibition in 1881 in a ten 300 feet in circumference, made especially for the occasion. The enterprise had the backing of the florists of the community, with whom there were then seven, and of the professional growers of fruits and vegetables, of whom there were 65. The interest of the townspeople in planting and beautifying their city is shown in the fact that, in addition to the local stock, 21 carloads of nursery stock had been shipped in that spring.

A later exhibition of the Society is of interest to us because of an announcement in the News that “the attraction for today’s session, the concluding one, will be a paper on ‘Shade Trees’, which W. N. Byers of Denver, President of the State Forestry will read.” This paper, telling of the trees which he had grown and the problems he had encountered and his conclusions thereon, is of such interest that it is hoped that it will be possible to print it in its entirety in some future issue of the Green Thumb.

Water, or the lack of it, played a leading role in the dramatic development of the West. Samuel Bowles, an early traveler, here, painted a grim picture of our country in 1885, which while certainly exaggerated, serves to point the part irrigation played in growing much of our present beauty and prosperity. It reads in part: “Trees will not live in the yards, house owners can have no turf, no flowers, no fruits, no vegetables—the space around dwellings in the towns is a bare sand relieved by infrequent mosses and weeds. The grass is gray upon the plains: cottonwood and sappy pine are almost alone the trees of the mountain region: no hardwood is to be found anywhere: and but for the occasional oases by the streams, and the rich flowers that will spring up on the high mountain morasses, the country would seem to the traveler nearly barren of vegetable life.”

There are a number of stories of the beginnings of wheat farming in Colorado, most of which give the credit to Mr. Byers. But his own account simply says that “it is remembered by the author and other settlers of that day, that two or three heads of wheat were discovered in a lot on Larimer street, near 15th in Denver. The seed had been dropped from an emigrant wagon in the summer and were thus late maturing. The heads were of splendid form, the grain of unusual size and fine appearance. This circumstance at once gave the suggestion and the start to wheat planting.”

There is as yet no complete biogra-
phy of Mr. Byers: but, from an idea of what he personally was like, a sketch by Albert B. Sanford, of the State Historical Society tells us that he was "a man with a most kindly eye, a frame strongly knit, sandy hair and beard. Always affable, easily approached, ever ready for a gracious word and a helping hand to friends."

He lived in several homes about the city, in his years here, and around all of them he lovingly planted trees, shrubs and flowers. An article in Trail and Timberline for June 1931, called "In Quest of the Unusual Among Denver's Trees" describes those around his last home on South Washington street, which was torn down to make room for the Byers Junior High School, though the trees, of course, have been carefully kept and tended. Mr. Pesman writes:

"Is the American Chestnut hardy in Colorado? Well, there is a full grown specimen on the Byers Junior High School Ground... The bur oak there is as beautiful a specimen as I know. Here we have a wealth of trees not found in any other small ground in Denver. We should notice a very large hackberry directly south of the building..."

A full grown Kentucky coffee farther south, the black walnuts on Pearl street, the linden, Norway, and sugar maple (side by side) and plane trees (or sycamore) on Washington street... a small horse chestnut north of the old residence planted in 1897... It is now gorgeous when in bloom and bearing fruit each year. White birch, cutleaf, soft maple, apricot, hawthorn, mulberry—Mr. Byers succeeded in growing them all."

One of Mr. Byers' friends, Florence Burton, wrote: "In Denver's City Park stands a line of noble trees, the first and largest there, which were planted by Mr. Byers with an eye to the future. Leafy monuments to his memory, were there no other."

Attempts to find out exactly which ones they were have been unavailing. But another of his friends remembers, as a little girl in the old Broadway school, being taken in a bus to City Park with other children to plant trees on a long ago Arbor Day. The holes were all dug and the trees waiting to be planted, on the road beginning at the 18th Avenue entrance and winding in front of the green house. So, for lack of evidence to the contrary, why not accept these, as the first trees planted in City Park?

Under the heading "Local Brevities" in the early paper, Mr. Byers and his staff kept track of important small things, as follows:

"Some of the trees and gardens along Broadway and the adjoining streets are being badly mutilated by vagrant cows, whose proper place is either in their owner's stables or in the public pound."

And he follows a note of the bending of a local orchard under a load of fruit with the observation, "Let the orchardist who avert that fruit can't be grown here, make a note of the above."

Another time he reminds his readers that "maples and box elders are said to be the best species of shade trees to set out... Citizens should bear this in mind."

And, if he were alive today, I am sure at this very time he might be in the process of writing an editorial for his Sunday edition, urging "that it is the duty of every man who has the welfare of his state at heart to contribute his mite to the success of the movement to secure an arboretum for his favorite city.

OLIVE HENSLEY.

A series of double salts of nicotine gives promise of being more stable and hence more effective as insecticides, than the simpler nicotine salts which have long been used.

PLANT-LIFE AREAS IN COLORADO

In trying to supply information regarding plants and horticultural practices for Colorado, we have realized the great difficulty in putting out any lists or rules which will apply equally to all sections of the state.

In Colorado we have probably more variation in climate than any other state. We have plains or almost desert areas: high mountain areas: rich, irrigated valley areas: and foothill and mesa areas. We have a great variation in altitude and rainfall; in character of soils; in length of growing seasons; and in protection and exposure. Then latitude makes for further variation in each of these north and south strips. We know that only certain plants will grow in the San Luis Valley, and that others are peculiar to the country around Sterling. To enable us to be of most help to all the varying areas in the state, we felt the need of a more definite method of referring to these different regions.

The accompanying map is a preliminary effort to divide the state into plant-life areas. By defining the boundaries of these areas, we have considered the following factors: altitude, rainfall, irrigation, latitude, length of growing season, soil and protection. We have combined the information found on existing maps, and checked with all available authorities. We fully realize that there will be many exceptions to any divisions that we can make, but we will attempt to outline areas where average conditions are similar. Where small areas have conditions better or worse than the average of the area, they can make suitable adjustments. Naturally, we have made closer distinctions in regions of larger population and have lumped together some regions of small population. While all sections of the state are important, there will be many times the calls for information in places like El Paso county than in places like Cheyenne or Dolores counties.

It is our plan to publish lists, from time to time as material is collected, of recommended plants for each area. We might start with suitable shade trees, and follow with evergreens, shrubs, hedge plants and perennials. Most of these lists will be arranged in two parts: Plants which may be expected to do well under average conditions, and those which might grow under exceptionally favorable conditions.

This objective may seem to be an endless and hopeless task, but if we can do even a little toward helping residents to become acquainted with more and better plants, it will be worth the effort."

We will need the cooperation of EVERY member who is acquainted with growing conditions in even one area of the state. We will especially need the assistance of residents in counties distant from Denver. If you know the country around Juulesburg, Craig, Durango, Springfield or Fairplay, will you please let us know of your willingness to cooperate in checking lists of approved plants? And please give us suggestions as to how we may improve our lists.

GEORGE W. KELLY.
CULTURE OF ALPINE PLANTS UNDER LOWLAND CONDITIONS

By Helen K. Fowler, Shadow Valley Gardens.

HOW ENVIRONMENT CAN BE CHANGED TO GROW PLANTS REQUIRING ACID SOILS.

Many gardeners all over the world dream of growing the evanescent Mayflower but few reach its accomplishment. For centuries the docile species of plants—the civilized Peony, the Phlox, the Hollyhock, the Iris have yielded to man's dominion. Success with this group as with Roses and water plants often make him long to venture further, to try those rare kinds that prefer acid soils—the Painted Trillium, the trailing Arbutus and the lily-like bear tongue. I am not sure these plants prefer an acid soil: they may not even like it, nevertheless they are compelled to live in it.

Have you a space in your garden, not too dominant, with just a suggestion of informality and a background, perhaps of delicate spring foliage—a place where you can bring to flower a few of these woodland treasures? Several years ago in my own garden a 10 x 15 ft. plot was devoted to growing the Arbutus, the Bunchberry, the Foam Flower and the Moccasin Flower. Later were added the Mayapple, Partridgeberry, Spring Beauty and Dicentra cucullaria, which, to be seen, explains its common English title. This need not be a complete ecological grouping but one reasonably correct as to plant relationship. In such a bed you may dig in oakleaf mold or soil from beneath the Pines or you may remove existing soil to a depth of 18" to 2' and fill in with soil of definite acid reaction or you may change the soil at hand by adding quantities of peat and sand or again you may sprinkle the bed surface with aluminum sulphate, one-half pound to the square yard for very light soil, more for loam and most for clay.* While aluminum sulphate is usually used, after a number of years, it is likely to increase the aluminum content, with possible harmful results: sulphur is used sometimes but that is also apt to form sulphuric acid which, even in small quantities is often injurious to plants. Tannic acid, which is found in plants and soils themselves, is preferred by many to any other chemical: a solution of 1 part to 50 of water is recommended. This bed should then stand for two weeks for thorou assimilation of the acid.

The really desirable native plants demand at least approximately the conditions of soil, moisture and light to which they are accustomed. Just because a plant must have acid does not mean it will do well in the sun if it requires shade nor will it live in dry soil if it likes moisture. The Native Columbine (Aquilegia canadensis) and the Philadelphia Lily, now known to demand intense acid must also be given dense shade.*

One of the difficulties in growing any alpine plant in the lowland is the great difference in the length of the growing season compared to what it experiences growing in the wild. Here, in Denver, between the last spring frost and the first frost of autumn or from about May 1st to the end of the first week in October, some times even a month later, we have from 150 to 180 days with half that time where plants grow wild.

Shall the Soil Be Rich or Poor?

A very lean soil has been found necessary for the alpine plants' best growth. Dr. Regal, way back in the 1800's made this observation in a paper written on the Swiss flora: his theory was that poor soils slow up the rate of growth, causing them to maintain their characteristic compactness which is their chief charm, and also the damping-off may result from a lush growth and later winter cold may kill them. While the ground must not be rich it must be open enough for excess water to drain off so that plants do not suffer from drought.

The Acid Test

How shall I know when there is enough acid in the soil to grow these plants? It will help any gardener to know how to make a simple, rapid test of the soil to determine the pH concentration. Here we have that terrifying symbol pH, which is nothing more than a sign to denote the proportion of acid or alkaline. There are soil-testing outfits still to be gotten at any of the seed houses and at the Denver Fireclay Company: with exact directions for using. The scale of measurement should not seem too difficult: it is really easier to do the testing than to talk about it. This scale runs from pH4 to pH9, which includes the whole range of soils in which any plant can grow. pH7 is neutral, below is acid and above is alkaline. pH6 and pH7 do not bother the gardener because between them are included all normal garden soils for growing our common trees, shrubs and perennial plants. pH4 and pH5 are our chief concern here. They are of such significance that a list of cultivated plants is of record; for instance, the Pink Ladyslipper, trailing Arbutus, Calla palustris, Pitcher Plant and Clintonia borealis belong to pH4. In pH5 we find the Calla Lily, several species of Trillium and the Rocky Mountain Columbine —yes, our state flower must have acid. Scores of others are found in both lists. After some experience the gardener will find that he will recognize the requirements of each without any analyzing equipment, but at first it is the wise thing to know what the soil had in the wild and then try to duplicate it in the garden.
Maintaining Soil Acidity

It is one thing to build an acid bed and quite another to hold it. Materials from adjacent ground seem to want to creep in so it is well to build the new bed higher than the surrounding area; then too the water for irrigating is inclined to be alkaline, that from ditches supplying irrigation extremely so. We have two kinds of water serving the city of Denver. Mr. George J. Turre just now gave me today's (Feb. 6) test-reading: the Moffat water has a pH of 7.75 and the South Platte a pH of 7.4. You may see from the scale how the water from the hose may change the pH. When little water is used for a very small bed, the worry isn't so great. Of course aluminum sulphate or tannic acid water may be made from the city water.

Winter Protection

If we happen to have snow all winter, which we rarely do, our plants are protected; but here in Colorado we have alternate thawing and freezing so we must use covering-first to maintain an equable temperature within the soil: this covering should be put on after the first hard frost in order to keep the ground frozen: second, to prevent too early a spring growth and last to shade the plants from the burning Sun.

A Plant For Alkaline Soil

Some few plants like either acid or alkaline and will live where there is neither but there is one of the loveliest of autumn flowers that will grow in but one kind of soil, the Japanese Anemone. We move it all around our garden, trying it in acid and neutral soils but it must have alkaline for its best; and, remember it does as well in sun as in shade here in Colorado.

Other Woodland Plants

There are many woodland plants for formal or informal planting that will thrive in any garden where there is good drainage and lots of humus* —the Virginia Bluebell (Mertensia virginica) and the blue Phlox (P. divaricata) should never be omitted from the May garden; Hepatica (H. actiuloba) and the shooting star (Dodecatheon meadia) come even earlier; Bloodroot likes a place all to itself in the shade where it can colonize: are we forgetting the Elder Daisy—the Ox-eye—of times forgotten? See it in the Jan Van Houten and the Eric Douglas gardens with the blue and darker Iris, and Mrs. Perry Poppy, for the combination of white, lavender, purple and salmon pink we all so admire: in spite of the widespread of its arching branches, the Bleedingheart does not seem out of place even in a small garden,—it flowers with the late Narcissus and the Darwin Tulips and should be used as an accent plant in the flowering scheme. When, late in the season, the tops begin to die down, Chrysanthemums may be planted to fill out the vacancy left by the disappearing foliage.

Anchusa myosotidiflora, the Russian for-get-me-not, runs a risk of forfeiting the honors it won in spring by indulging in a “cabbagy” summer foliage: this is surely only a matter of planting. Near the lungwort, the Pulmonaria, the two running in adjacent groups can be very striking. The Primulas are always associated with the beauty of an English spring. They will continue to bloom year after year in a rich woodland soil.

Fall Crocus and Colchicum

Why do we not have the fall Crocuses and Colchicums splashed all over the garden as we do Tulips in the spring? "How", they tell me, "is it possible to get the Crocus' feeling" when leaves are drifting and when the only proper garden adornment is fertilizer and the wheelbarrow?" To be sure, they are as much a part of October as Daffodils are of March.

H. K. F.
pH value 4 5.0 6.0 7.0
very acid acid slightly acid neutral neither acid nor alkaline alkaline strongly alkaline

Humus—Decayed vegetable matter dug into the soil to open it up and supply sponges that will hold the moisture. Do not water too much. This is done all over Denver. Air is most essential to root growth. If the soil is made soggy by too much water there is no room left for air.

BIBLIOGRAPHY—
Alice Eastwood—A popular Flora of Denver, Colorado.

PLANT LIFE FROM MANY ANGLES

Here is a new feature. Let us know if you like it. E. H. Brunquist has volunteered to help us assemble material for it each issue. It will contain all kinds of interesting notes about plant life, but particularly those items which apply dynamic, and remaining alive only as the result of constant expenditure of energy. E. H. BRUNQUIST.

A MIRACLE INSECTICIDE

After the war DDT will become available for civilian use. It is apt to change our entire method of insect control. The army uses DDT successfully as a delousing chemical, a very low concentration being effective for a long period. Recently an entire island was sprayed with DDT by a torpedo bomber, which killed every insect on the beachheads and in swamps, as the invisible mist of the DDT solution settled. Only two quarts of the solution are estimated to be necessary per acre.

New miracles effected by DDT are reported as time goes on. It may develop into an all-around insecticide. The latest report comes from the American Phytopathological Society meeting in Cincinnati, showing its effect on potato leaf hoppers, with great success.

Even frogs and fish can be killed by DDT. It is little toxic to mammals, except in high concentration.

M. WALTER PESMAN.

Mrs. H. M. F. H. Jackson—12-page article—Process of Flowers in Colorado in her Bits of Travel at Home and Abroad.
Francis Ramaley—Colorado Plant Life.
Burton O. Longyear—Rocky Mountain Wildflower Studies.
M. Nielson Armstrong—Field Book of Western Wildflowers.
G. F. Saunders—Western Flowers Guide.
Francis Potter Daniels—The Flora of Boulder, Colorado and Vicinity.
Ernest Charles Smith—Identification Key for the Spring Flowers of North East Colorado.
Wild Flowers—Homer D. House. (In color).
Western American Alpines—Gabrielson,

Of Mice and Worms and Quercus

JOHN STOCKBRIDGE

A while back, Quercus was out to our house for tea (he wanted to see my wild roses), and I am informed that after he got home he sat down and wrote something for "The Green Thumb" about my "Reeking Compost Pile."

Quercus, that wasn't my compost pile you smelt! It was a mouse that had gotten into the kitchen—or almost into the kitchen—and, being unable to make the last inch into the land of plenty and unable to find its way back to whence it came, had perished miserably. We didn't perish but we were miserable until the mouse dried up. Tined Lysol and Gentle Harrows——just with a spring tooth harrow, first set at an inch, then at two inches, then at three and after a while with a disk. Then he grows things.

So what does this ex-insurance man do? I'll tell you what he does (and I hope Organic Gardening is not listening in for it knocks their and my compost-pile fetish into a cocked hat). He just lets his trash—any kind of trash so long as it's vegetable matter—lie on the ground and after the winter has worked on it he goes out and he harrows and harrows and harrows—just with a spring tooth harrow, first set at an inch, then at two inches, then at three and after a while with a disk. Then he grows things.

This handling of trash gives the earthworms something to eat and Quercus something to think about.
ORIENTAL FRUIT MOTh FOUND IN COLORADO

By F. HERBERT GATES, State Entomologist

The Oriental fruit moth, an insect that attacks such fruit as almond, apples, apricots, cherries, nectarine, peaches, pears, plums and quince, was introduced into the United States, possibly in ornamental trees from Japan about 1914. From this introduction, the first infestation was found in the District of Columbia. Since then the insect has become established in every state east of the Mississippi River with the exception of Wisconsin, Maine and Vermont.

In the fall of 1942, California reported an infestation of Oriental fruit moth in Orange County. Immediately following the report of this discovery, California set in motion the operation of quarantines. An appeal was made by the fruit industry of California to the General Assembly for funds for investigations and research and to maintain the proper regulations for the control and possible eradication of the insect. Surveys were started at once to determine the area of infestation. First, including only the counties in Southern California. As the surveys progressed, new infestations were found and recorded. At the present time Sutter County, the “peach bowl of California,” has been found infested.

In the progress of the survey of the Federal Bureau of Entomology and Plant Quarantine, three different groups of inspectors were sent to Colorado for fruit and field inspections. These crews approached the commercial fruit areas by the way of backyard trees from the south, east and west, surveying and inspecting all backyard trees on farms and in cities. These crews entered from New Mexico, Utah and Nebraska, converging upon the commercial peach orchards of Mesa County.

In 1943 no infestation was found in Colorado. However, in 1944 survey crews discovered moths in traps in Prowers County. This infestation is the direct result of transportation of fruit from Kansas. Upon arrival in Lamar, this fruit was found to be “wormy” and was thrown in the ash can by the Summer. The adult moths emerged from this fruit to cause local infestation.

Following the discovery in Prowers County, the moth was caught in traps near the fruit dump in a wholesale fruit market in Denver. In August, traps in the railroad section of Grand Junction, Mesa County, picked up a few moths.

It is conspicuous that in all inceptions of the moths in traps, the traps were in the vicinity of railroad yards or fruit dumps and NOT in commercial orchards. This is in accord with discoveries of all past infestations in other states.

Upon finding the moths in Colorado, plans were started by the Bureau of Plant and Insect Control in cooperation with the fruit industry for the establishment and maintenance of an insectary in Mesa County. Here parasites will be produced for the control and possible eradication of the Oriental fruit moth.

The insectary will raise hundreds of thousands of parasites to be liberated in areas where the moth was discovered. The areas of suspected infestation will be flooded with wave after wave of parasites throughout the growing season.

The insect passes the winter as full grown larvae in cocoons. Early in the spring, the larvae changes to pupae. The adults emerge about the time the peaches are in full bloom. This emergence period may last for as long as 8 to 10 weeks. This condition makes possible adults from the first, second and third broods at the same time.

There are four stages in life cycle; the egg, larva, pupa and adult. The egg is grayish white and measures about 1/35” across. It is laid mostly on the underside of the leaves near the terminal ends of growing twigs or peach trees, and on the upper surface of leaves of apple and quince trees. Incubation period is from 3 to 40 days, depending upon the temperature.

The larva is from white to dirty pink and measures about ½” to ¾” long. During the summer: the larval stage is from 6 to 15 days, while in the fall it is much longer.

When the worm is matured and ready for pupation, it eats its way out of the fruit and either drops to the ground by means of a silken thread or crawls down the tree and spins a cocoon. The cocoon may be found under objects on the ground or part of the tree, or in other places than the host plant. In the cocoon there is a prepupal stage which may last 3 - 5 days, thereby making the prepupal and pupal stage last about 15 days.

The adult moth is small and grayish-brown with a wing expanse of about ½”. It indulge in a very active, zig-zaggy flight at sundown. The female lays from 100 to 200 eggs for a period of 7 to 10 days, starting 2 days after emerging.

Upon hatching in the spring, the young larvae wander along the terminals of twigs and start feeding. This continues until the small fruit is formed. Then the larvae leave the twigs and enter and feed within the fruit. Each successive generation of the worm feeds within the fruit for the remainder of the season. If, however, there is no fruit crop, the worms continue to feed within the terminals of the twigs. Thus, whether we have fruit or not, the insect is propagated and does severe damage to the trees, causing them to have the appearance of having been horned-back, and the fruit wood is destroyed.

Control: The artificial control of the Oriental fruit moth has not been successful. Standard methods such as spraying with arsenicals have not been satisfactory in that the worm when entering the twig or the fruit ejects the food, bites and enters into the twig or the fruit before feeding is started.

Natural or biological control is the only hope at present. This consists of the development and liberation of thousands of parasites in infested areas.

DAMAGE TO FRUIT CROPS

In areas infested with Oriental fruit moth, damage to the fruit crops may be from 10% to as high as 85%, depending upon climatic conditions and the population of the worms. These periods of high and low infestation are unpredictable, which adds greatly to the seriousness of any infestation. Periods of low infestation may continue for several successive growing seasons when little damage is experienced. However, if during these periods, the infestation increases in intensity, the subsequent crops may be almost a total loss. The insect, if it becomes established in Colorado, has reason to be more serious than in other localities. This is due to the fact that fruit areas in Colorado produce most of the host plants covering the entire growing season.

Starts with April, the host fruits follow by cherries, early peaches, pears, late peaches, and apples affording a constant preferred host range.

If this insect should become established in the fruit areas of Colorado, it is quite possible that the added cost due to the loss of fruit and commodity treatments would be so heavy as to preclude the possibility of any profit to the fruit grower or the industry in general. The district infested, if necessary, would be forced to make provision for fumigation for much of the fruit sold. This fumigation would have to be done in the
Oriental fruit moth is, perhaps, one of the greatest threats not only to the fruit industry but to the economics of the State. There is no precaution that should be neglected.

WE WILL SHARE WITH YOU

The last few weeks have been most encouraging. Many new memberships have been coming in, and we now have a large enough number to show us that there is a real appreciation of the work we have tried to do. Still more encouraging to us personally has been the offers of services by experts in the writing of articles about the many phases of Colorado Forestry and Horticulture. These contributions are the thing that will make the Green Thumb worth while. But as the membership and the magazine grow there is a greater and greater number of things to be done to keep everything going right. This necessitates delegating more and more duties to others. We have found a great deal of enjoyment in working to put the magazine on a sound basis. We are sure that many others would enjoy helping. We need, for instance, an art or photo editor, an editor for a rose column, and there are numerous little clerical duties that any one interested should enjoy doing. If you would like to help please let us know.

We have had a suggestion that we start a surplus swap column, from Carla Swan, who writes: "This way people like us who have thousands of iris every summer could find homes for the half a million others we throw away. Also there might be things that others grow in too great abundance that we would like very much to have." If any are interested, send us your lists.

TREES FOR EASTERN COLORADO

The editors appreciate very much having members write us their reactions about articles in the Green Thumb. We can only guess how well we are satisfying the readers unless they let us know.

We have had many fine comments about Jules Renaud's article "Sanctuaries in the Plains". Among the better known Gooseberries are the varieties, Champion, Downing, Josselyn, Perfection, and Red Lake. Widely cultivated in the Northern Plains, the Bush Cherry, representing selected fruiting strain of Prunus bessyi, is extremely liberal with its white blooms in the spring, and in late summer, the branches are crowded with dark, mediumsized, red cherries. Prunus tomentosa (Nanking Cherry) has a very pleasant surprise with its juicy cherry-like red fruit during summers without damaging late spring frost. Cane fruits, such as raspberry delight in Colorado climate, with irrigation, but volume of fruit is proportionate with the protection the young canes have from drying out over winter. Truly successful in tending the one-season kinds, is the practice of covering the canes with dirt after July's growth: however, the main July crop is lost if the one year canes have not survived the winter. Latham, Marlboro, Chief, Cuthbert, and Newburg are red one-season varieties. The interest formerly bestowed on Dewberries, and later Youngberries, is now justifiably focused on the big luscious Boysenberry, the thornless strain naturally being preferred. The gardener who grows Boysenberries should determine at an early date if his location requires protective covering over winter for the vines.

(Continued from page 2)

SMALL FRUIT: These fit into any size home fruit plan. Hardest are Gooseberries and Curtains. Among the better known Gooseberries are the varieties, Champion, Downing, Josselyn, Prattwell, Carrie, and Poosman, which are of American origin. The giant size English varieties suffer in our soils and climate. Curtains are diversified as to color of fruit, occurring as black, white, and the popular reds. Varieties of red currants of earliest bearing type are, S. Renaud, 'Sanctuaries in the Plains'. The latter has some scattered bearing trees to its credit from Ft. Collins southward. Pears perhaps have justification of more planting than is currently the case, especially with blight resistant varieties. Old time standard varieties are mildly represented; however, future planting would likely benefit from the hardier pear varieties originated in the north, such as Mendell, Parker, Patten, and the Canadian variety, Tait.

Amoung plums, peaches, and sweet cherries, a number of varieties are not self pollinating, and should be planted with another variety of the same species for optimum setting of fruit.
northern sector and in the open plains. Concord is the best known blue grape; Fredonia is a counterpart except that it is two weeks earlier than Concord. Diamond is a fine sweet white grape as are Niagara and Portland: Caco is a good red. Such varieties may be planted with fair confidence in city and suburban gardens, since the environment of buildings and trees will lend a desirable protective influence. Skirting the foothills, one finds an occasional vineyard of commercial size. In case of doubt as to hardiness, the Bega grape, also Alpha, will boldly grow in any climate or under any conditions. Concord is known the world over for its abundance of fruit, and will yield about 100 pounds of fruit per vine if grown under proper conditions. It is a medium of size and flavor between the parents.

Good garden soil and irrigation at the proper times will yield an abundance of home grown strawberries. Since the majority of home gardeners grow everbearing varieties, the long list of June bearing kinds would perhaps be of more interest to the commercial grower. The Gem has acquired the best all around record of the everbearing strawberries: hardness is a primary virtue, but quality, size and flavor are also satisfactory. Mustod will exceed Gem in size and is milder in flavor, but is not quite as tenacious. Just this year plant stock is available of two strawberry cultivars of the Cheyenne Horticulural Field Station, which probably are the hardiest in cultivation. These are called “Cheyenne 1.” and “Cheyenne 2.”; they are June bearers of medium size fruit that have excellent flavor and aroma. Parentage is the native Rocky Mountain strawberry crossed with commercial varieties. These can be best appreciated where other strawberry varieties will not thrive, such as in the mountain cabin or ranch, or they might even be naturalized at the back of the garden. A third variety has also been released for propagation.

Since they are parallel with fruits in their perennial nature, it would not seem out of place to mention the very hardy and easily grown asparagus, rhubarb. and even horseradish. McDonald College of Quebec has taken the spotlight in glorifying the rhubarb. New varieties, McDonald, Ruby, Chipmar Red, and Canada Red are fine improvements: their features are milder flavor and prominent red coloring of the stalks. Canada Red and Chipman Red have red color even through the center of the stalks.

Fruit for the home cannot only be valued in economic return, but also in health. Landscape value and adding wholesome atmosphere to good American family life. No tree has as much character as the old apple tree in the yard whose presence is the almost legendary to a generation or two who have barked their skins climbing up among its limbs.

Fertilizers and Insecticides Scarce This Year

Officials of the W. P. B., W. F. A. and O. P. A. say that because of increased military demands for ammunition there will be a reduction in the fertilizer supply for 1945. They also indicate that supplies of pyrethrum, rotenone, nicotine sulphate and DDT will not ease after V-E day but will continue short until after the close of the war.

The last "Readers' Digest" tells the story of a young ex-marine who has come home and tried to go back to high school. After his strenuous and efficient living in the South Pacific, the curriculum in the schools here seems very inappropiate to him. He asks why he and a few thousands like him can not have training in trades and businesses which they will want to follow. Among these he mentions landscaping. We should see to it that any service man returning to Colorado is able to take an efficient course in landscaping or associated work.

The Park Hill Garden Club of Denver, writes Mrs. Carl Cross, has made one of their objectives 100% membership in this organization. She says that Bob More, with his fine talk on Evergreens, inspired 16 of their club members to join. That 100% goal is a worthy objective for all the garden clubs in the state.

Mrs. G. R. Marriage, Colorado Springs nurseryman, writes: “Your Lilac Survey is a real achievement." Mrs. Marriage has accumulated a real achievement in her fine contributions to The Green Thumb.

Henry F. Lake, Jr., Gunnison editor, writes: “Your Lilac number is a work of art. It should be greatly appreciated by the garden lovers of the West." Mr. Lake himself grows 77 varieties of lilacs in the mountains above Gunnison.

Mrs. Helen Fowler, of Shadow Valley, deserves the orchid—or whatever gardeners consider the apex of flowerdom, for she has alone brought in over $1,000 in sustaining memberships to the Association by her enthusiastic and tireless efforts.
SEASONAL SUGGESTIONS

March and April

While we may have some of our most disagreeable winter weather this month, still we will see signs between storms of the approach of Spring. We will have the promise of renewed life as we see the sprouts from fall bulbs poking their heads up, and later there will be the thrill of the first crocus and snowdrop.

Although it is hard to resist the call of Spring when the first warm day comes, remember that this is Colorado and go easy. We might have a Spring like last year again, when it was cold right up to the time it got permanently warm; but the chances are about ten to one that we will have several spells of winter before it is really safe to do Spring work. This is one important time when we should not believe all we read in horticultural literature. This "spring kill" is one of the peculiarities of Colorado climate that we must learn about. So don't go out and remove all the mulch from the roses on the first warm day of March.

One thing that we should remember to do, if it was not done last fall, is to spray with a dormant spray for any scale insect that we find: especially elm scale and oyster shell scale on lilac, dogwood, and cotoneaster. This dormant spray of miscible oil or lime-sulphur should also kill some eggs of other troublesome insects.

If it should warm up enough to thaw the soil and dry it out, you may work off some of that Spring fever by spading the garden. Spade under all the compost possible.

If you can spade the garden, it is time to plant sweet peas. Dig the soil deep where you want to plant them, and work in plenty of manure or other fertilizer.

Any time that the frost is out and the soil dry enough to work is time to transplant trees, shrubs and perennials. With the lack of help this year, nurserymen will have to start early to get half their work done.

You can begin to clean up the garden even before the frost is out. Do not remove all the protection around perennials and roses at the first warm spell and do not burn all the mulch removed. Leave all the fine material to decay further. Tall dead stalks and weeds can be removed anytime. The dead tops of Buddleia, desmodium, hibiscus and such can be cut off now, but remove the rest of the winter mulch gradually, between now and May.

If you plan to start some of your own vegetable plants, plan now for a hotbed, or boxes in the window.

Rhubarb and asparagus should be transplanted as soon as possible. Put a bottomless box or basket over a few plants of rhubarb so that you may have some to use a few days earlier than the rest.

Clumps of peonies can still be moved successfully if they are dug with a ball of dirt and moved carefully.

Don't let large masses of ice or snow remain on the lawn too long. It may smother out a spot. If your lawn was planted in the usual poor soil found around new houses, you will have to give it its annual "shot-in-the-arm" of fertilizer any time now.

Many annuals self-sow. Such plants may have their seeds sown very early. Some of these are larkspur, cornflower, cosmos, calendula, marigold, petunias, poppies, and portulacas. Most seeds of flowers and vegetables other than these mentioned should wait to be sown until the ground warms up in May. Try planting some gladiola bulbs early, and a few more each week thereafter. They should be planted quite deep—6 to 8 inches—for most bulbs are better planted a little deeper in Colorado than recommended for the East.

If you have any way to get to the foothills you may find some of the early wildflowers following a week of warm weather. Look on the warm south slopes for Pasque flowers, Oregon grape, early candytuft and Spring beauty. There is a thrill in finding these first flowers not exceeded by the thrill of the masses of color in June.

When some warm days come in April, it is worthwhile to risk a few seeds of the hardy vegetables. If they come up you are way ahead, and if not, nothing much is lost. Try radishes, lettuce, smooth peas, spinach, turnips, onions, carrots, beets, Swiss chard and parsnips.

Look for the early bloom on trees and shrubs. How many have seen the bloom of an elm and maple? They come after a few warm days in March or April. The Buffaloberry's tiny yellow blossoms come very early before you expect anything would have the nerve to open. The alder catkins will soon expand, and dwarf iris may peak through. Crocus and snowdrops will appear almost out of the snow in warm spots. The yellow bells of the forsythias, tiny white flowers of the early spireas will be showing up. Flowering almonds, currants and plums will be coming and then everything comes in a rush.