PROGRAMS AT HORTICULTURE HOUSE

Friday Evenings in March, 1948
Mar. 5 Some Denver Gardens, illustrated with colored slides by Edward W. Milligan.
Mar. 11 Denver Rose Society. All persons interested in roses are invited to attend.
Mar. 19 The Care of House Plants, by Beanda Conway.

HELP, HELP

We must have hundreds of members who have experiences with plants that would be worthwhile to pass on to others. As a starter suppose you write your ideas and experiences on the following subjects and send them in to us. We will publish some of the more suitable of these. As a little incentive we will reward the writer of each item which is published a year's membership in the Association. These are the subjects that we will take for this month:

"The Street Tree That I Like Best."
"Two Good Rock Garden Plants."
"My Favorite Combination of Perennials."
"A Good Plant for Espalier Use in Colorado."
"A Native Wildflower Suitable for Cultivation."

Keep your story between 100 and 300 words if possible.

Front Cover—Odontoglossum grande. Sepals and petals chestnut, red and yellow; lip white blotched with red-brown.

SCOUTING TRIP

The first outdoor trip of the season has been announced by the Outdoor Programs committee. The date is March 14, and the time is 9 A.M. at Horticulture House. The trip will be to the site of a proposed new botanical area below the Stapleton Drive. This area also contains several miles of the old Beaver Brook Trail, which it is proposed to renew. Rocks, timber, streams, parks and steep slopes make this area an ideal place for a botanical reserve. Early wildflowers may be out at this time. Come dressed for anything. Bring lunch and a can of soup to contribute to the community pot. Register and arrange for transportation at Horticulture House as early as possible.

ORCHIDS TO HELEN FOWLER

It was announced at the annual dinner of the Colorado Forestry and Horticulture Association that the library at Horticulture House has been named The Helen Fowler Library to honor Mrs. Fowler through whose generosity and vision the library has been made possible. Mrs. Fowler's own collection of about 500 volumes was the nucleus of our library. In addition to giving these books, she has given and raised several thousand dollars to increase the size of the library. Her knowledge of horticultural literature and her untiring efforts in seeking rare books have brought together a remarkable collection in a very short time. Her enthusiasm is an inspiration to those who work with her. We who use and enjoy the library owe her a continuous debt of gratitude and we look forward to her welcome visits and the further additions of interesting books she invariably brings.

OUR ADVERTISERS

The fine cooperation being given by the commercial horticulturists of the state is enabling us to print this magazine every month. If it were not for the income from the advertising your membership would have to be twice what it is to cover the cost.

We believe that we are rendering a service to the gardeners of the state by printing these announcements of nursery, landscape and seed firms. By a reference to our advertising pages you may find "where to buy it." We believe that the firms here represented are reliable and worthy of your support, but inclusion here does not represent a guarantee by us.

We also believe that we are giving good value to these advertisers, as this magazine reaches most of the garden minded people of the state. We, and our advertisers, would appreciate it if readers would call attention to the fact that they "saw it in the Green Thumb."

MORE HELP NEEDED

The editor of a magazine like this must be a pretty good guesser to figure out what the membership wants! The tendency is to give the readers the things that he likes and to hope that they like them, too. We want to make the Green Thumb fill the need for horticultural information adapted to our Rocky Mountain climate. It would help us greatly to do this if each reader would let us know the particular things that they like about the magazine and give suggestions for improvements which would make it more valuable to them. Look over other horticultural magazines published elsewhere and let us know what features you think we might adapt to our use. Thanks.

Beautify your yard this Spring. Phone or stop in at Marshall's, your nursery and landscape headquarters, where we can help you with your designing and planting problems.

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Horticulture in the
GRAND VALLEY

Grand Junction and the surrounding towns enjoy conditions which are favorable for the development of horticulture to a higher degree than anywhere else in the state. So far as the commercial side is concerned the residents of this valley have realized their advantages and have taken a leading role in the improvement of cultural methods of such things as peaches and alfalfa. The annual meeting of their Western Colorado Horticultural Society last January was attended by over a thousand people, and they had brought in the best horticultural experts to give them the latest information on every phase of their work.

They have been so busy making a living that they have rather neglected their wonderful possibilities in the way of ornamental horticulture. True, they do have some problems of alkaline soils and scarcity of water; but in spite of this there are many people over the valley who have demonstrated that a great variety of beautiful trees, shrubs and flowers can be grown there.

Now that the living is assured, we hope that they will begin to pay a little more attention to making their community beautiful and livable so that they and their children and their many visitors may be proud of it. It might easily be made into one of the most attractive communities in the state.
THE WEEK-END GARDENER

There are signs of spring all around this afternoon. The snow is almost gone from the south side of the houses and the air begins to feel warm. I'll look around a little before I go in. Aha, there is the tip of a tulip breaking through the soil south of the house. I must get all that trash out of the way so it, and others, may come along unrestricted. I expect that there are some crocus coming through in several places too. I'll come out after lunch and really clean the garden up.

The Oldtimer was by just as I started my big cleanup and warned me that there might be more winter, so that spoils my big job for the afternoon. There are several bare places under the trees and around the edges of the garden where the frost is almost out. I believe that I will clean them up and seed in some of the hardy self-seeding annuals. Larkspur, Calendula, Sweet Alyssum, Cosmos, Marigold, Bachelor's Button and Portulaca would probably like to be scattered around now. I can then forget them until warm weather. I might try some of those seeds that I saved from the wildflowers in the hills last summer. Some of them might like it here if I did not coddle them too much.

That reminds me that there are likely to be some wildflowers in bloom in protected places in the hills—on the south slopes of the hogback and foothills. I'll take the family into the hills tomorrow and we will hunt around for those first hardy blooms. The yellow clusters of the Oregon grape flowers, the purple of the Stork's bill, the yellow of the Bladder pod, and possibly some Pepper-and-salt parsley or even a Spring beauty. Let the snows and cold come. We know that when we see these early things in bloom that spring can't be far away. To see these first things is more thrilling than the sight of all the hills covered with brilliant bloom later in the season.

KNOWING PLANTS VS. KNOWING THEIR NAMES ONLY

By Grace Gibson Freeman
Reprinted by Permission from Castanea

There seems to be a tendency among both professional and amateur botanists to be satisfied with knowing just enough about a plant to be able to give it a botanical or common name. More satisfaction, it seems to me, is to be gained by knowing the plant first and the name afterward.

There are so many spectacular things to be learned about plants that I often wonder why botanists waste their time counting hairs on a leaf surface in an attempt to make it a sufficient difference for the basis of a new species. That habitat is an important item concerning plants is understood by most plant collectors; very few, however, go much further in their search for plant knowledge. There are often interesting things to be learned about the life histories of plants if one will only keep watching throughout the year. Flowering stages of plants are usually not neglected but fruiting stages frequently are overlooked. Often the adaptation of a plant for growing under unusual conditions is of great significance. This may cause the development of special tissues or organs. Numerous other things not so obvious need close observation and study.

Fertilization is one of the most important factors in maintaining the health and vigor of your trees and shrubs. Your Swingle representative, with a background of intelligent study and experience combined with the facilities of our careful research, is always at your call to advise as to the best fertilizer for your trees' requirements.

Each species of plant is characterized by certain, morphological features which distinguishes it from other species. Likewise there are differences between species in their physiological functions and growth habits; hence in their NUTRITIONAL REQUIREMENTS. In some these differences are highly distinctive and generally well known while in others they are so slight as to be almost indistinguishable even to the trained physiologist.

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MAINTENANCE OF STREET TREES

This is the fourth and last of our series of articles dealing with street trees for Colorado. This discussion of maintenance problems will be divided into several sections, each written by an expert in that line.

In addition to the knowledge of trimming, spraying, fertilizing and combating insects and diseases, careful thought should be given to proper watering and in some cases cultivation. Cultivation is, of course, only needed when the parking strip in which the trees are planted is not in lawn. Then it is needed to keep down weeds and to prevent the surface of the soil from becoming too hard.

Systematic watering is probably the most important consideration in the maintenance of healthy, vigorous trees. In many cases the soil available for the root run of street trees is restricted by pavement and sidewalks, so that it is doubly important that the remaining soil be kept sufficiently moist at all times.

Fertilization of trees growing under street conditions is of vital importance. Fertilization will aid the trees greatly in resisting the ravages of insects and fungus diseases to which they are constantly exposed. Street trees have a decided disadvantage over those growing in their natural environment as they must fight a constant struggle for their very existence.

We specialize in building rock gardens and perennial beds.
that they may live. Under these conditions it is utterly impossible for a tree to get one half of the necessary moisture and minerals required. A healthy tree is beautiful if not marred by storm or human hands. To balance nature and compensate for the loss of minerals we must use artificial means by fertilization with chemicals that are balanced to give that particular tree or trees the proper diet.

The National Park Service has for many years used and recommended the punch hole system of fertilization. This is a simple operation and can be accomplished quite easily with the aid of a good iron bar. Drill holes 14 to 18 inches deep and 2 feet apart, between the curb and on both sides of the sidewalk, starting 6 feet from the tree. On trees having a trunk diameter of 6 inches or more work outward with your circles slightly past the branch tips. Fill the holes to within or two inches of the surface and then water. This should be done now and every few months until the middle of the following summer. You will be thoroughly pleased at the quick and healthy response which will be noticeable in a few weeks. Caution: Do not fertilize from August through October as you may over-stimulate wood development. Trees fertilized at this period do not have time to consolidate the stimulated cell structure caused by fertilization. Winter kill usually follows the early fall feeding of trees and shrubs.

If you have not had a soil analysis it would be a good investment as you would be advised as to the quantity and type of fertilizer best suited for the trees' requirement.

Trees are like people. To withstand the constant exposure to disease they must have proper nourishment to give them the energy to resist. Do it now and do it right!

TRIMMING

By John W. Swingle

Shade trees are highly valuable property; thus their maintenance has taken on a new significance. Proper pruning is essential. Remove the dead or branches and as few of the live limbs as possible. Make every effort to preserve their natural beauty.

Wounds to which trees are constantly subjected are the cause of much of their ill health. In vigorously growing trees most of the tiny wounds heal quickly without leading to any important damage. However, in each open wound lies potential disfigurement, impaired health or untimely death. In many cases the ultimate harmful results that follow such injuries can be prevented by prompt treatment after wounding occurs.

Remember that trees living under street conditions are growing under decided handicaps, i.e., they do not get proper nourishment, they are constantly menaced by cars and other vehicle injury and, in some instances, they must be severely pruned to prevent electric and telephone line interference.

Give the following suggestions serious consideration. They will be very helpful and will aid greatly in the healthful maintenance of your trees.

1. Plant varieties suitable to the climate in which you live.
2. Fertilize, water and spray as suggested in this and previous articles.
3. Plant them carefully when necessary, making neat flush cuts and by cauterization and waterproofing of the wounds prevent infection.
4. Be alert in the event of vehicle damage to the trunk or lower branches. Call a reputable tree expert promptly to render proper treatment.
5. Make sure that you have at least 12 feet road clearance from the lower branches.

Follow the above suggestions carefully so that you enjoy the beauty and comfort of your trees in the many years to come. They are your responsibility. Indifference and neglect on your part may not only cause a loss of your tree or trees, but menace the whole community as well. Too numerous examples can be cited where neglect has put the whole community to unnecessary expense. Since the discovery of the Scolytus beetle here in Denver, we must be doubly alert as they are virus carrying insects of several diseases, including the Dutch Elm disease (ceratostomella), Verticillium and the serious Cephalosporium wilt which our research has brought to light in the past few weeks.

Periodic examinations by qualified tree experts is most essential if Denver is to maintain its reputation as a city of beautiful trees.

INSECT ENEMIES

By Paul N. Morrow

In order to keep street trees healthy, vigorous and beautiful, some consideration must be given to the control of insects. The listing of these insects that are common in the Rocky Mountain area must of necessity be brief in this article.

The ash is comparatively free of insects, but has one very dangerous enemy, the Oyster Shell Scale. Due to its ability for rapid reproduction, it can reduce the vitality of a shrub or tree very fast. The Oyster Shell Scale has a number of natural enemies but these are not dependable for control measures. Dorman spraying with lime sulphur or miscible oil for 2 or 3 years in succession will give excellent control. This scale also infests lilacs, poplar, willow and silver maples.

Our beautiful white birches are very much affected by aphids, and by another, much more serious pest, the Bronze Birch Borer. The beetle stage is olive bronze in color, slender and about one-half inch long. The larva is a slender, white, flat grub, three-fourths inch long. It attacks all parts of the tree above the ground. Usually by the time the symptoms of the insects become evident, the tree is in serious trouble and it may be impossible to save it. The beetle emerges from the bark through small semi-circular holes during late May or early June. After emerging they lay white eggs in the crevices of the bark. A spray applied at this time will give some measure of control. This spray must have residual contact and ovicidal values, such as 2 percent miscible oil with D.D.T. It must be applied at the time the beetles are emerging and laying their eggs in the bark crevices. This operation should be repeated for 2 or 3 years to obtain any great measure of control. The birch borers, as with most other borers, usually attack trees weakened from other causes. The best preventive is to keep trees vigorous by proper
feeding and watering. This applies to control of all insects on all trees. Our elms have quite a number of insect enemies. The outstanding one at the present time, causing widespread damage throughout the Rocky Mountain region, is the European Elm Scale. This insect can best be controlled by dormant spraying as with the oyster shell scale. It differs from the oyster shell scale in one way; it goes through the winter as a live insect and not in the egg stage.

Another insect enemy of the American elm has recently invaded the Rocky Mountain area, the "Elm Bark Beetle" (Scolytus Multistriatus). This insect has been causing widespread damage in the Eastern states for some time, but was only discovered in Denver during the fall of 1947. The first appearance of this insect may go entirely unnoticed; especially in a tree with lowered vitality. A more vigorous tree with considerable sap flow, will start coming from the small "shot-like" holes (made by the adult beetle when entering or emerging from the tree). This sap becomes sour, attracts wasps, bees and can be smelled when near a tree. The insect attacks by boring small holes through the bark into the sapwood where each female creates a brood chamber, depositing up to 140 eggs along the sides of this gallery. On hatching, the young grubs leave the brood chambers at right angles either to left or right, thus creating a characteristic burrow.

The beetles appear around the first of May and feed sparingly on the buds and leaves and even the bark in the small crotches before entering another tree. It is during this feeding period that the beetle may inoculate trees with the causative organisms of the Dutch Elm disease.

The best preventive method is to keep trees vigorous by proper feeding and watering; a residual contact spray applied at the time of emerging should give some measure of control. The first brood should appear in May and the second brood sometime in August.

The Cottony Maple Scale, while not as persistent as Elm Scale, is a very destructive enemy to a great number of our ornamental trees and shrubs; including maple, elm, honey locust, willow and horse chestnut. The young adult females, dark brown, one-sixteenth inch in length, roundish or oval in outline survive the winter in an inactive stage, attached to the under side of the smaller limbs and twigs, covering themselves with a secretion resembling lacquer. Some survive the winter as newly hatched nymphs, staying in the nests which look somewhat like popcorn. The control of this insect is the same as that of the oyster shell and elm scale.

Aphids are a pest that are quite numerous on nearly all plants and trees and the damage they are causing is being taken too lightly. They multiply very rapidly and can become a serious threat to a tree in a very short time. Very good control can be obtained with nicotine sulphate and pyrethrum sprays.

The experienced spray man may be able to control a number of insect pests with one and the same spray by proper timing. The quality of the material and thoroughness of application is always a paramount factor in the control of any insect.

**SPRAY EQUIPMENT AND CHEMICALS**

By Chas. H. Behse

There are any number of hand sprayers on the market which are capable of doing a satisfactory job on plants, shrubs and small trees. In most cases the use of a powdered insecticide applied with a hand duster will be found to give equally as good results as insecticides mixed with water and applied with a sprayer. Powdered insecticides can be purchased ready to use, hence do away with the need of measuring, mixing with water and generally keeping agitated while in use. Either plungers or bellows type dusters will be found satisfactory.

When the spraying of moderate to large trees becomes necessary it is advisable to call on the services of a professional sprayer equipped with high pressure equipment. Medium to large shade trees require ten to thirty gallons of spray material each for adequate coverage while tall trees require a sprayer capable of throwing a spray stream fifty or more feet. Large estates, park departments and institutions with a considerable number of trees may find the sizable investment necessary in a power sprayer worthwhile. It should be borne in mind, however, that a considerable volume of spraying will be necessary to pay for the original cost, depreciation, repairs and replacement of such items as spray hose and other rubber parts which deteriorate rapidly when oil sprays are being used.

Whether a liquid spray or dust is used, in whatever make of sprayer or duster, satisfactory results cannot be expected unless thorough coverage is obtained. This means that every part of the plant must be covered with dust or spray, underside as well as tops of leaves and stems and application must be made from two or more directions.

Spray materials used for insect control generally are classed as either stomach poisons (i.e., must be eaten by the insect to cause death) or contact poisons which, as the name implies, kill upon contacting the body of the insect. Stomach poisons are of value only for foliage eating insects such as certain worms and beetles. In this class of chemicals will be found many of the old but still reliable insecticides such as arsenate of lead, paris green, etc. Contact chemicals include many familiar names: nicotine sulphate, lime sulphur, dusting sulphur, pyrethrum, rotenone, miscible oils as well as a host of newer insecticides such as DDT, Chlordane, benzene hexachloride and many others.

Volumes could be, and have been written on insecticides, their proper application, correct dilution, value for various insects and so on. It should suffice to say here that only materials should be used which are known to be satisfactory or which are recommended by authorities on the subject of spraying. Products of a reliable manufacturer should be chosen and his directions followed implicitly. Further, no insecticide will do a satisfactory job unless properly applied. This simply means that contact sprays must actually contact all the insects and stomach poisons must coat all the foliage.
If the orchid bug bites you, you never recover." This was said to me by a distinguished retired judge in North Carolina who had begun to raise orchids as a pastime but eventually became one of the largest commercial growers in the United States. My infection by the virus was, however, almost accidental and the origin of my orchid house was the result of trying to utilize something already on the premises.

Some years ago my doctor husband had built in our back yard a small glass house 6 x 9 feet which he used in his research on hay fever plants. This experiment was successfully concluded in two seasons—the project finished. There stood the little glass house, and the question was, what to do with it?

For one winter it served to shelter a flock of chickens, but neither we nor the chickens enjoyed it! The following year I was persuaded to try raising various hardy species of plants, such as English violets, violas, etc., in earth warmed by an electric cable placed in the benches under the soil. The sun furnished the only other means of heat. Several periods of bitter cold and dark days proved that this arrangement was not practical. I then consulted the Public Service Company, who installed a small gas boiler in the basement of our home from which pipes were run under ground to hot water radiators in the greenhouse.*

Then I set about raising a variety of perennials and annuals, and probably would be doing so to this day had not my sister presented me with two orchid plants to celebrate the arrival of real heat! That was the beginning, and I found myself taking more interest in these two little cypripediums than in the rest of the inhabitants of the greenhouse.

The experience of growing plants successfully for two years in the small well-heated house fired me with the ambition to do something bigger and better, so I queried an architect and contractor as to whether a larger greenhouse could be built that might be heated by the same furnace. It could be. A blueprint of specifications was sent to Lord & Burnham in Des Plaines, Illinois, who responded with my present pre-fabricated greenhouse, 12 x 18 feet. It contains side benches, a center bench, and a utility unit at one end comprising sink, bins, cupboard, open shelves, and a workbench. Since some of the plants hang in baskets and some against the wall on boards, the maximum capacity is about 250 plants.

When the new house was finished I started to make purchases of orchid plants and others were given me. The quest for them led me as far as California on the west coast, where I visited the magnificent "Palace of Orchids" of Armacost & Royston (who employ 25 to 30 women to do nothing but pot seedlings) and to Baltimore on the Atlantic. A firm in Baltimore directed me to the orchid houses of Judge Way, in Southern Pines, North Carolina. Under his kindly tutelage I learned the methods and the fascination of orchid culture. He took me with him on his rounds of the houses and the potting sheds where he showed me by actual demonstration how to pot, to water, to pick, and to care for the orchids, both terrestrial and epiphytic plants, at all stages of their lives. Always, thereafter, when he sent me shipments of plants, he would write out painstakingly in long-hand specific instructions for the care of each individual plant. He knew that I was an ardent convert.

In the ten years since the new house was built, the collection has grown in such varied ways that I have named it the "Orchid Orphanage". Some plants were purchased from various growers in this country, and others from Mexico, Guatemala, and Panama were given to me. Many of these latter are still unnamed, as the war interrupted my attempts to identify them. More came from my sister's home in California after her death. The climax was reached one day in 1940 when I fell heir to over 100 plants from the dismantled Fern House in City Park.

The crowding in my greenhouse soon became a problem, and I was forced to eliminate the violets, chrysanthemums, and carnations to make room for the fast-increasing collection of orchids, which now includes many different varieties of 14 or more species. As you can imagine, the blooms of this collection vary greatly in shape, color, and size; some have a very delicate fragrance. In color they range from white through the yellows to orange and deep brown; from light lavender through the mauves to dark purple and maroon. They are all fascinating, and one who spends time caring for them feels well repaid when greeted by one of these glorious flowers, especially on a cold, snowy winter morning.

**CARE OF ORCHIDS**

The fundamentals of good orchid culture are proper and accurate controls of temperature and humidity plus a good airing of the house once every 24 hours. A temperature of at least 58 to 60 degrees should be maintained at all times, so the ventilation must be carefully handled in cold weather. Remember that in their native haunts many orchids grow high on trees. They do not want to be stilled in civilization. By careful study of the different varieties one soon learns the best location in the house for each plant.

**WATERING.** The ideal way to determine the need for water is to feel each plant and judge how thirsty it is, by the texture of the leaves and state of the potting material. The hanging ones require more drinks than those in the bench pots. Some epiphytes have root systems which produce pseudo-bulbs above the potting medium. If these bulbs are firm

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*On account of fumes it is wiser not to have a gas heater inside a small greenhouse.
1. Dendrobium dearii—flowers pure white, Philippine Islands
2. Stanhopea tigrina—flowers creamy yellow dotted with brownish purple, Mexico
3. Cattleya Susan Hye alba—flowers white with yellow throat, South America
4. Odontoglossum—sepals and petals yellow with brown stripes, lip white, throat purple, Guatemala
5. Cypripedium maudiae—sepals and petals green and white striped, lip pale yellow green, foliage mottled.
6. Laelia praestans—flowers pale lavender, lip reddish purple, Brazil
7. Cypripedium aureum—flowers light yellow, dorsal sepal white at tip, India
8. Epidendrum cochleatum—sepals and petals pale yellowish green, lip purplish black, Tropical America
9. Cattleya Bourlingiana—flowers light rose purple, lip darker on front lobe, throat light, Brazil
10. Oncidium ornithorynchum—flowers fragrant, rose lilac, lobes of lip darker, crest yellow, Mexico and Guatemala
11. Cymbidium—flowers pale yellow, crimson border on lip, India
12. Oncidium Cavendishianum—flowers yellow with slight greenish cast, lip bright yellow, Mexico
and full, the plant has enough water; if wrinkled, it should be given more. In this dry climate of Colorado the whole interior of the house, roof, walls, and floor, have to be wet down two or three times a day in the heat of summer. During cloudy weather less moisture is needed. A shading compound is a must in summer for the roof glass, but little shading, if any, is needed through the winter months.

POTTING. The cycle begins with potting. Terrestrial orchids are potted in a mixture of leafmold, soil, and sphagnum moss, the potter being careful to have the crown of the plant at the soil level. Pieces of broken pot are placed in the bottom, which must have a good sized hole for adequate drainage and air circulation. (It is possible to buy special orchid pots.) The epiphytes are potted in osmundine moss, which should be broken up and shredded. It is wise to examine this moss carefully before using to detect any trace of mildew which may cause a fungus disease. The moss should be packed very tightly around the roots and a sprinkling of granular charcoal should be added to all pots as a purifying agent.

As a rule re-potting should be done every two or three years after the plant has bloomed and new growth has started. When re-potting, keep all plants in a small pot as possible. In dividing cattleyas, leave at least three bulbs on the front end; if the back bulb or bulbs have a good eye, pot them up separately. Oncidiums do not divide readily but back, leafless bulbs of cymbidiums, in very small pots with plenty of moisture, are apt to start new growth.

Wire racks should be used to hold the pots four or five inches above the surface of the bench. In the absence of water pans in which to set the racks, there should be placed, beneath and between the pots, small chunks of coke which provide means for retaining and evaporating moisture. A celluloid label showing the name of the plant, its date of blooming and its date of repotting should be placed in each pot.

SPRAYING. Since orchids are not prey to as many insect pests as are their more commonplace fellow-flowers, one spraying a week with insecticide should be sufficient. This freedom from insects is one of the things which endears orchids to their growers. Blights and fungus diseases, however, may play havoc in the greenhouse. I use a solution of Wilson's OK and Black Leaf 40 in the following formula:

<table>
<thead>
<tr>
<th>Large Quantity</th>
<th>Small Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 qt. Wilson's OK</td>
<td>2 1/2 oz.</td>
</tr>
<tr>
<td>1/2 oz. Black Leaf 40</td>
<td>17 drops</td>
</tr>
<tr>
<td>3/2 gal. Water</td>
<td>1 qt.</td>
</tr>
</tbody>
</table>

BLOOMING. The majority of orchids bloom once a year and then they have a resting period until new growth starts, during which time they should be kept damp, but not watered as much as in the growing season. The blooms should always be cut when perfection is reached, and you will have better results with your corsage if the flower is kept in a cool place over night before being worn. Obviously orchids, like children and husbands require steady care, love and attention. For the person who wishes to raise orchids as a hobby, I feel that natural species are far more interesting than the glamorous and exotic hybrids.

Although in large establishments the many varieties of orchids are separated into houses of different temperature and humidity, here is a list of the species that I have grown successfully in my one-room Orchid Orphanage:

- Cattleya
- Brassia-cattleya
- Cattleya
- Bowringiana
- Coelogyne
- Cymbidium
- Syripidium
- Dendrobium
- Trilocina

Because of the pleasure and gratification I have had from this fascinating hobby, I hope this informal story may inspire others to venture in the same field.

The following books are both interesting and helpful:

- Curtis, C. H., Orchids for Everyone, E. P. Dutton & Co. MCMX.
- Linden, Lucien, and Rodigas, Emile, Iconographie, Gand, 1889; Des Orchidées, Vanderhaeghen, 5me volume.
- MacDonald, Norman, The Orchid Hunters, Farrar & Rinehart, 1939.
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JACK HARENBERG SEZ

Some of us who tried to get a new lawn established late last fall found that our cold weather crept in sooner than we anticipated, and that only a small per cent of that seed germinated and is showing a little green; this is not serious if on dry warm days you have watered and kept this ground from drying out. In late March, when you figure it might be about the last snow, sow some seed over these thin, bare places (on top of the snow). This eliminates a lot of scratching in, and gives an opportunity for the seed to germinate early.

Too many of us fertilize too early in the season. Our winter winds and heavy thaws carry away a good part of the fertilizer. We feel that fertilizing in late March or early April is an ideal time, for the plant life then can take this food up, on account of the slow seepage at this time.

You who are looking for table decoration at this time of year, will find that your Red Dogwood twigs, Yellow Dogwood, Pussywillows, and Japanese Barberry will make very interesting arrangements.
THE WEEK-END GARDENER

I'm really anxious to get on my old clothes and go to work in the garden today. Except on the north side of the garage, the frost is out, and the ground is inviting me to dig in it. There is something about turning over the soil in the spring that hits me deep inside. Maybe it's a throwback to my early ancestors, but the smell and feel of freshly worked soil makes me feel good. I feel like a partner of Nature.

I'll spade under some of that manure and compost in my vegetable and cut-flower garden. The soil can then lay rough, and mellow with the freezing and thawing and rains that are sure to come before it is really warm enough to plant the tender things.

While I am at it, I'll make a place to plant the sweet peas. I can't see that it makes any difference whether I plant them on St. Patrick's Day or a week later, but that old story reminds me that they should be in early. The old custom of digging a deep trench and backfilling with rich soil is not superstition for I have seen it produce some wonderful sweet pea blooms. There, that's a good job done, and I'll just about have time to dig up a few rows to plant some of the smooth edible kind of peas. It's funny how the smooth kinds like Alaska like to be in early while the wrinkled kinds will not come up unless they are planted when the soil is warm. Good fresh peas are one garden vegetable that we can't get too much of. If we raise more than we can eat fresh we can freeze or can them.

I'm going to take a chance on planting a few gladiolus bulbs now. If they are planted quite deep they will never be hit by any frost that will still come this year, and they can form lots of roots ready to grow in a hurry when the weather is really warm.

The oldtimer says that a few things like Bleeding hearts, Rhubarb, Asparagus and Peonies should be moved very early before they start to send up sprouts. If I can find some nursery or seed store that has them for sale now I will plant what I want while they are thoroughly dormant.

"The further men get, I think, from the pines the worse for them. Life, if we had never left them, might be plain and hard, and men would not stop fighting or even murdering because they lived in such a place as this—history dispels any such illusion. They might suffer bodily pain and know great weariness. But they would not toss with insomnia, or doubt till they could no longer act. Men to match these trees might raise the devil but they would never for one moment believe in the sicklier saints. You could hardly be small here. You might, sometimes, have a noble thought."

DONALD CULROSS PEAITIE
in "Flowering Earth."

To protect the Earth... is the fundamental conservation. Not all citizens can participate here, but every citizen can be mindful of the necessity of it and aid in creating public sentiment. I wait for the coming together of new organizations and societies that shall have for their purpose the conservation of fertility. These will be much more than agricultural and rural organizations and their work need not be technical or occupational. They may include all persons, and the discussions and interest may run the range of men's relation to land.

LIBERTY HYDE BAILEY
Reprinted by Permission from The Land
On the other hand, composts have the advantage in that their use is safe in inexperienced hands, for they are not too rapid in their action. Against this advantage must be placed the fact that their composition varies considerably with the residue employed, so that the nutrients in them may not always be well balanced. Organic manures, moreover, do not always contain all the essential nutrients, especially those elements required in very minute amounts—manganese, boron, zinc, copper, molybdenum, cobalt, and possibly others. These elements are fairly uniformly distributed in rocks, but in some soils they are known to be either absent or unavailable to the plant. There is some evidence that one of the reasons for this unavailability may result from insufficient decomposing organic matter in soils where the humus maintenance has been neglected. However, where nature has omitted to provide in the rocks and soils sufficient amounts of all the major and trace elements, or if present originally they have been reduced by crops or leaching, applications of composts from material produced on such land will not remedy the deficit. In some fertilizers trace elements are present as impurities and in some regions they are added to the fertilizers.

The inorganic or mineral fertilizers are referred to as “artificial” by the various humus schools. According to them, the only soil amendments that can properly be applied are the “natural” ones, meaning the products resulting from the decomposition of plants with or without the intervention of animals. The term “artificial” was applied when fertilizers were first introduced to distinguish them from farmyard manure. The designation is misleading, inasmuch as some of them are just as much products of nature and, therefore, just as natural as farmyard manure—possibly more natural. Examples are the kainits and other potash salts mined from natural deposits in Europe and this country; Chilean salt peter (nitrate of soda) from mines in South America; rock phosphate from deposits in this country and elsewhere, and finally guano—the excrement of sea-fowls found mainly in islands off the coast of Peru.

There are castes too among the humus school. Condemning the use of fertilizers that are “chemical,” one group, nevertheless, makes use of lime, basic slag, a product of the steel furnace, and also rock phosphate, but ban superphosphate obtained from the latter, in which the phosphorus is in a more available form.

**Effect on Soil Bacteria and Earthworms**

With respect to soil bacteria, there is no evidence that fertilizers result in injury. No significant difference in their numbers has been found in field plots without any fertilizer and in those which have been treated with fertilizers continuously over a period of years. The number of bacteria and other organisms can be greatly increased by the addition of organic matter; but there is no virtue in mere numbers for an increase in their numbers during the decomposition of organic matter high in carbohydrates and low in nitrogen may deprive the plant of its nutrients for, as we have seen, the food utilized by both is similar.

Another argument of the humus school against fertilizers is that earthworms won’t flourish in soils to which “chemicals” are added. This is only half a truth. The facts are—and there is much experimental work on the subject—that the injurious factor is soil acidity. It is true that fertilizer plots treated with ammonium sulfate without lime additio contain no earthworm casts, but that casts are more abundant in such plots when limed. Provided, therefore, the soil is not allowed to become too acid, earthworms thrive in plots which have received heavy applications of inorganic fertilizers. Earthworms and other small animals will migrate to soils particularly rich in suitable organic matter, but their numbers are not reduced by the addition of fertilizers even in ordinary soils. There is no doubt that the earthworm’s contribution to soil fertility is considerable and possibly the subject should receive more attention by scientists.

**Alleged Effect on the Plant**

The anti-fertilizer crusaders assert dogmatically that chemical fertilizers increase the susceptibility of plants to insect, fungus, and virus attacks, and that plants grown on composts are free from these attacks. The experiments of orthodox science do not support these claims; rather the experimental facts—and they are considerable—point to their value in reducing many diseases.

**Effect on Quality of Crops**

The composition of the crop is affected by soil amendments in whatever form they are supplied. The need is for a proper balance between the various nutrients to supply the requirements of the plant as well as the nutritional needs of the animal or human consumer. No sound experimental evidence exists that organic manures have any special value with respect to quality or that well-balanced fertilizers are detrimental. Foods raised under the same conditions on organic manures and on chemical fertilizers have been carefully compared without any nutritional differences being found either with respect to proteins, carbohydrates, fats, mineral salts or vitamins. The problem of quality in foods is obviously complex and the surface of the subject has hardly been scratched.

In review, then, we see that there is room for all methods of balancing the soil losses of the trio—nitrogen, phosphorus and potassium. The sound viewpoint is to use organic materials of all kinds for humus and chemical fertilizers for additional nutrients. Extremist viewpoints should be avoided.

**WINTER PLANNING FOR THE VEGETABLE GARDEN**

**February** gardening should consist mainly of planning for the actual work that comes later. It will save many valuable minutes, when planting time comes, to have most of the details worked out and plainly down on paper.

In the early spring enthusiasm there is a tendency to plant many things which will not be used. Consult the likes and dislikes of the family and do not plant spinach, for instance, if no one eats it. If everyone likes tomatoes, however, plant plenty of them. A careful plan now will help to avoid many mistakes.

In the Rocky Mountain area special consideration must be given to the length of time required to mature a crop. In high altitudes it is possible that little more than lettuce, cabbage, peas and spinach will grow, while lower down it may be possible to grow melons and tomatoes.

Almost all gardens resolve themselves into three sections: the early vegetables such as radishes and lettuce; the vegetables for canning such
as tomatoes, beans and beets; the storage vegetables such as cabbage, carrots and turnips. These crops may often be planned so that two different things can be harvested from the same ground in one season.

The mechanical layout of the garden is also important. In an irrigated region the rows should run in a direction providing enough fall for the water to run easily but not enough so that it will wash. If horse cultivation is used the rows should if possible run the long way of the plot. Tall things should not be placed where they will throw too much shade on low things. It is usually convenient to plant the earliest things nearest the house, so that it is not necessary to walk through soft ground to reach them.

A vegetable garden may be planned that is beautiful as well as useful if thought is given to lines, mass and height. After a plot has been in garden for several years it is well to think of rotation, since soil becomes exhausted if used indifferently for the same plants.

Food for Roses, Delphiniums and Sweet Peas

- ½ Wood ashes
- ¼ Soot
- ½ Bone meal

Helen Fowler

THE WEEK-END GARDENER

I BELIEVE that I can really begin to get into the garden work this afternoon. The frost is almost out and most of the soil dried up so that it will work well. The most important thing needed now is to do some transplanting. The spirea bush under the front window is getting entirely too large. It shuts off the view and light. I need a large shrub to screen the ashpit. I’ll just move the spirea around. To dig it with sufficient roots will be a big job and take most of the afternoon. When I get it set in the new place I will take time to give it a thorough trimming—not a GI haircut but a thinning out of the older stems way down to the ground. While I am at it I will dig the holes for the new trees that I have ordered from the nurseryman. Then they can go in promptly when they come.

The rest of the day I will spend in working over the perennial borders. After a few years they seem to go all to iris and fall asters. I’ll just dig all these rank growing perennials out, move the things that are left as I had indicated on the plans that I made last fall, then fill in with a few divisions from the best iris and asters. I’ll have a lot of shasta daisies and goldenrod left over too. I’ll take all these surplus plants, which are really good, down to one of the schools in the lower part of town and see if some of the children there will want to take them home. I expect that I should ask the teachers to let me tell the children how to plant and care for them or they will not stand much chance of growing. If the children do not want all of them some might be naturalized in suitable places along the highway.

I must browse around at some of the nurseries and pick out some new varieties of ‘Mums and Daylilies. It is remarkable what a variety of kinds and colors have been introduced recently. Even the iris has been improved so much recently that I would hardly recognize some of the newer kinds as being related to the oldfashioned varieties.
REPORT OF THE ROCKY MOUNTAIN HORTICULTURAL CONFERENCE
HELD AT DENVER, COLORADO
FEBRUARY 2ND AND 3RD, 1948

The conference was highly successful, both from the point of view of attendance (more than 230 people registered during the two day session) and from the variety and interest of the papers and informal talks given by the many experts who came from as far away as Michigan, Wyoming and Utah to join our Colorado foresters and horticulturists in giving us the benefit of their experience and research. During the following months the Green Thumb will carry extracts from the various speeches made at the conference. In the meantime here is a summary of the highlights.

Dr. A. C. Hildreth, Supt. Cheyenne Horticultural Field Station, spoke of what is being done and needs to be done in research on growing conditions and plant adaptation for the mountain and plains region. Clinton H. Wasser, Associate Range Conservationist, discussed Climatic Differences in forest and grazing lands in this area. Homer J. Henney, Director Agricultural Experiment Station, Fort Collins, described the agricultural problems that come to them for solution. Plant Panels on Evergreens, Shrubs and Trees, Perennials and Roses were held by local authorities on these subjects.

On Monday evening a buffet supper was given at Horticulture House for the visiting speakers, officers and committee members of the Association, after which a large audience gathered to hear Carl Fenner, Asst. City Forester of Lansing, Michigan, describe the excellent system of tree care in his city. Fred P. McKown, City Forester, Colorado Springs, told briefly of the progress being made there along similar lines.

On the morning of the second day the program was devoted to the subject of soil. Charles M. Drage, Extension Horticulustrist, Chairman, introduced Thomas L. Martin of Brigham Young University, Provo, Utah, who spoke compellingly on the deficiency of trace elements in the soils of this region, as elsewhere, and pointed out the results of this lack. A. P. Hoffman, Orchard Soil Specialist, discussed Chlorosis—A Deficiency Symptom.

The afternoon session was given over to Insects! A Canadian sound film—Insects in Action—showed the common vegetable garden pests magnified to many times life size. Comments by Gordon Mickle, N. D. Wygant, Bureau of Entomology, Fort Collins, discussed insect infestations and means of control.

The Annual banquet of the Association was held Tuesday evening, attended by 180 members and guests. The speaker was Arthur H. Carhart, Colorado author and conservationist. After some entertaining "tall tales" he discussed very seriously the Conservation Needs in Colorado.

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MARCH
Oh, blasts that blow and snows that snow,
Thermometer that sinks too low,
Deist I beg, I plead, I pray!
I've garden work to do today.
How can I prune a willow tree
When your winds keep it switching me?
How can I spade a garden spot
Or rake a lawn or grough the plot?
Please, Winter, when your act is done,
Make one quick exit—only one!
Your encores wreck my best-laid plans
And freeze ice in my sprinkling cans!

—MAUD MCMORRICK.
NOTES ABOUT THE LIBRARY

BY ALICE WOOD

JOHN JAMES AUDUBON

A DRAWING, "Rusty Grackle on Black Haw" by John James Audubon decorates the library at Horticulture House. Also in the library is the very beautiful book, "The Birds of America", published by the MacMillan Company. In this book are reproduced the original drawings from the Elephant Folio of Audubon's, "Birds of America". Since Audubon painted the birds in their native habitats they appear animated and natural.

In Donald Culross Peattie's, " Singing in the Wilderness", Mr. Peattie writes in a lyrical vein of Audubon's wanderings and his close communion with the birds of America. He comments, "Audubon had the unique gift of magnifying the minutest details of plumage in the foreground while keeping a distant background, with the most attenuated perspective, still clear and arresting." This book is a fitting tribute to a great naturalist who "walked with a woodsman's tread, venturing courageously on unbroken trails, missing not one bright wing in the bushes, exulting in the gift of life itself, passing it on as a creator to others."

WOMAN'S HOME COMPANION GARDEN BOOK

The Woman's Home Companion Garden Book just published by Doubleday & Company was written by fifty horticultural specialists and edited by John C. Wister, Director, Arthur Hoyt Scott Horticultural Foundation. It covers six geographic and climatic garden regions, garden making and practice, plant material and plant science, thereby being a valuable addition to garden literature for the entire United States and Canada.

The chapter on the Rocky Moun-

tain states was written by Milton J. Keegan who will be remembered by readers of "The Green Thumb" as the author of the authoritative and beautiful issue, "Lilacs for Colorado" (December 1944). Since this region has long been the forgotten country horticulturally it is gratifying to find a chapter on Rocky Mountain conditions included in this finely illustrated and comprehensive garden book. We take pleasure in complimenting Mr. Keegan on his text.

OUR FLOWERING WORLD

By RUTHERFORD PLATT, New York

Dodd, Mead and Company

This is an important book. Mr. Platt writes simply but eloquently on a subject of profound significance to all of us. In three divisions: "The Power Behind the Landscape, the Woods of Time and the Modern World of Plants", the author conveys to the reader his feeling for the mystery of plant life. We are told of the theory of drifting continents and how "plants have traveled far and survived an eternity to reach us". The photographs in color and in black and white are superb.

The conservationist and plant lover will read "Our Flowering World" with deep appreciation. To the novice it should open up a new world, the wonderful world of plant life.

In spite of the horrors that the people have suffered and the discomforts and anxieties that have still to be borne, the majority take great pride in their gardens. The English are a flower-loving people and in the most unsuitable conditions can manage to grow a plant or two.

ISABELLA PRESTON.
Reprinted from Your Garden and Home
"As soon as frost is out of the ground," say all the garden books, "and the soil is sufficiently dry, it's time to spade."

It is easy to tell when the frost is out, because the soil, which was as hard as a brick, becomes soft and muddy, so that at first you are in danger of sinking in up to your ankles when you walk on it.

Every gardener is anxious to get started as soon as possible, and there is danger that this impatience may cause him to work his soil before it is ready, a mistake which may cause serious difficulties which will last all season.

Then how can he tell the very earliest moment when it is safe to spade?

The most reliable test is a simple one—call it the mud-pie test. Pick up a handful of soil and pat it between the palms; if it holds together and makes a nice mud-pie, then it is too wet to spade. Keep off soil when it is in this condition, lest you form clods which will prove troublesome all summer.

The more clay the soil contains, the more injury it will suffer if spaded when too wet. Yet clay soil should not be worked too dry; in fact, you can seldom spade it then, for it is too hard.

There is a point between the two extremes when a handful of soil, patted between the palms, will crumble. It is not dry, but slightly moist, yet not wet enough to hold together in a mud-pie. At this point, even clay can be spaded easily, and will break up without forming clods. When the test indicates that this favorable condition prevails, do not delay spading, otherwise the soil may dry out unduly, and compel you to wait for heavy rains to restore the right degree of moisture.

DON'T forget to clean up that vegetable plot as carefully as you do your flower garden. Put on a good layer of manure which can be spaded under in spring.

P.S. Back Cover — Epidendrurn — sepals and petals pale green spotted with dark green; lip white with green spots.