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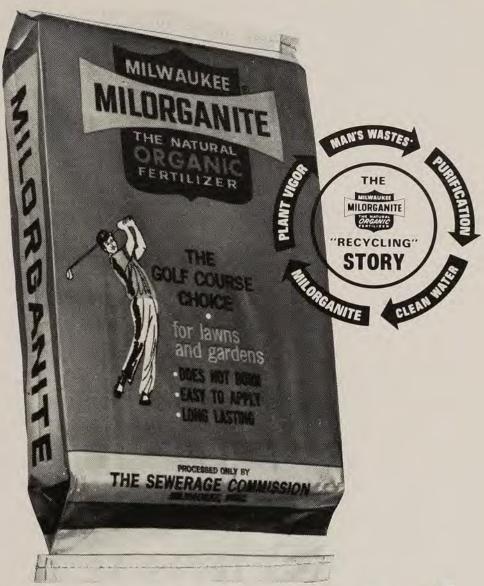
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an editorial

Propagating Horticulture

Spring is just around the corner; as days lengthen and buds swell, gardeners grow restless, eager for the new season. Who hasn't sent off orders for seeds and plants? Who isn't thinking about early tulips, summer annuals and vegetables, a glorious autumn filled with chrysanthemums and dahlias! Wishing our lives away? Not at all. Just squeezing every last drop of pleasure out of our plants—out of our gardens. The fraternity of gardeners is world wide. It is one of the rare fraternities that has no axe to grind, nobody to exclude, no profits to gain at someone else's cost. Plants will grow for everybody, rich and poor alike, and it's just possible that the geranium flowering in a tin can in a shabby city street gives more pleasure than the country club's display bed of pelargoniums due to the incongruity of the situation. Plants will grow everywhere, and anybody can grow plants. Horticulture ought to be a universal avocation. That it is not is a sorry inditement of those of us who gain so much pleasure from it.

It is very tempting to take advantage of the current status of unrest, crises of energy, credibility, morality, and all the rest, and, prophet of doom fashion press folks into growing plants for food, growing plants as a substitute for travel, and so on. Horticulture was never meant for that. Horticulture is something to enjoy for itself. Never say "you better stay home and raise a garden to save gas and to cut the grocery bill." Rather, point out that "you can spade up a patch of ground, working up a healthy sweat, and treat yourself to a whole summer of succulent table truck and invigorating exercise, and at the same time make a contribution toward fuel conservation and take the pressure off the family budget."

If seed sales are an indication, people will take to gardening this summer as never before. They will be looking to garden clubs, horticultural societies, and gardening neighbors for information and assistance. Where does the American Horticultural Society fit into this changing state of affairs?

A.H.S. is committed to serving the advanced amateur gardener; we are a sort of horticulture clearing house. Through our various publications—the handbooks, American Horticulturist, News and Views—our members know where the action is in American horticulture. The Directory of American Horticulture is a particularly valuable tool. When the phone rings and someone asks where to go for gardening information in a certain city the Directory provides information on that area's horticultural organizations, botanic gardens, arboreta, schools, plant societies, and so on. Half the trick today is knowing where to go for information. A.H.S. is exceptionally well equipped for pointing out sources. In the last issue of American Horticulturist you read about the plant information records at the computerized Plant Records Center. Our next issue will be an environmental symposium issue to explore the people-plants relationship. The actual symposium, itself, will take place in May at the River Farm. As the Society grows it is able to accept more and more responsibility for the propagation of horticultural information.

At A.H.S. headquarters at the River Farm the grounds committee is pushing for beautiful beds, borders and lawns by spring. An example is worth more than words, and a beautiful garden encourages viewers to develop their own grounds. Each A.H.S. member has an opportunity to do the same sort of missionary work in his home garden. Soft sell is the word. A.H.S. today is more than twenty thousand gardeners strong! We are in a position to set a nation-wide example—to introduce people to the thrill of getting to know plants. Our national office is taking care of the Big Picture; you and I, as advanced amateur horticulturists can work individually at the local level through horticultural societies, garden clubs, and plant specialty groups. Spring is coming; let's push for a blue ribbon crop of horticulturists this year.—

For United Horticulture ... the particular objects and business of The American Horticultural Society are to promote and encourage national interest in scientific research and education in horticulture in all of its branches.

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JOHN PHILIP BAUMGARDT, Editor

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O. KEISTER EVANS. *Executive Director*

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OUR COVER PHOTO—A spring vegetable patch photographed in Westphalia, Missouri, by Mr. Russell Gerhardt—everything a vegetable garden should be; neat, orderly, burgeoning with good things to eat and more to come. And with flowers and a view!

VEGETABLES THEN AND NOW

Gordon P. DeWolf, Jr.*



Brassica oleracea. The wild cabbage, from Flora Danica

I was talking with the author of a newspaper gardening column recently. That person admonished me never to indicate that gardening required "work" or "expense" because to do so would discourage potential gardeners. Such a person doesn't know what gardening is about. Gardening is about enjoyment, accomplishment, satisfaction and relaxation. It is also laborious (and sweat producing) as well as requiring a regular time commitment. A gardener finds that the labor and commitment are amply rewarded by the sense of accomplishment with the successfully raised plant.

Vegetables, no less than flowers, fulfill the gardener's desire for accomplishment. Beside food for the soul, vegetables provide sustenance for the body. No less than garden flowers they offer a continuity with the past, providing us with an occupation that has not changed much for centuries. Our vegetable garden plants are, many of them, very little changed from the plants grown by our colonial ancestors. Some, indeed, were grown by the Romans and the Egyptians.

What one grows is a reflection of what one likes, yet there is a basic group of plants that form the backbone of any vegetable garden. Such a list with various irreverent comments is presented below. If it were my garden, and space was restricted, and I wanted maximum returns, I would limit myself to Swiss chard, carrots, summer squash (vegetable marrow or zucchini), tomatoes and bush beans.

The Basic Vegetable Garden

A vegetable garden needs to do two things: (1) provide sufficient vegetables for immediate consumption and (2) provide sufficient surplus for storage and use during winter and spring. The size of the garden, is, of course, ultimately determined by the amount of space and time available. It is also limited by the amounts and kinds of vegetables to be grown.

Size

A garden area twenty-five by fifty feet (1,250 square feet) should provide a family of four or five persons with the basic vegetables in the basic amounts needed. Such a garden is small enough to work entirely with hand tools.

For city dwellers the space available for a garden is very likely limited by the amount of land available. Therefore space must be conserved. In a very small garden the space between the rows of plants can be reduced to as little as twelve inches.

^{*}The Arnold Arboretum, The Arborway, Jamaica Plain, Mass. 02130.

KITCHEN GARDEN FACTS

	Days to Maturity	Length of Cropping Period	Comments
GREENS	Duys to mature,	zengan or eropping renou	Comments
Swiss Chard	50-60 days	To end of growing season	A cut & come again vegetable. Freezes well.
Broccoli	3 months	To end of growing season	A cut & come again vegetable. Freezes well. Subject to little green "worms."
Brussels Sprouts	3 months	To end of growing season	A cut & come again vegetable. Freezes well. Subject to aphids.
Cabbage	2½-3 months	For an early crop start seeds indoors 5-7 weeks before the last frost—start a few more 2-3 weeks later. Early varieties tend to split in hot weather—so only plant as many at one time as you can use in a 2-3 week period.	Late season cabbage keeps well until cold weather sets in.
Cauliflower	3 months		An awful lot of work and space for what you get.
Lettuce	40-60 days	Individual plantings are only good for 10-14 days. A succession of planting is needed.	
ROOTS			
Carrots	2 months	To end of growing season	Good value for money—plant a row in mid-summer for young carrots in the fall.
Beets	1½ months	To end of growing season	Good value for money, if you like them
Turnips	2 months	Best plant in early summer for a fall crop.	They keep well but many people find that a few go a long way.
Parsnips	3-4 months	Late fall, winter, and early spring crop	Parsnips will keep in the ground over winter, but the tops should be mulched.
Onions	3-4 months		Stored dry and cool.
Leeks	4 months	End of growing season and into winter.	Good for fall and late fall—if mulched can be dug through the winter.
FRUITS			
Summer squash or Vegetable marrow	2 months		Subject to borers and rot, but worth the effort.
Tomato	1½-2½ months	From setting plants in garden to end of season.	Do not do well in very hot weather, set plants as early as possible.
Cucumber	50-60 days	Only compact vines need apply	Most varieties are rampant growers and take up too much space in the home garden. Dwarf or midget varieties are available some of which are preferable.
Winter Squash	3-4 months	Only compact vines need apply	Most varieties are rampant growers and take up too much space in the home garden. Dwarf or midget varieties are available some of which are preferable.
Cantaloupe	2-3 months	Only compact vines need apply	Most varieties are rampant growers and take up too much space in the home garden. Dwarf or midget varieties are available some of which are preferable.
Corn	2-3 months	Use only dwarf varieties	Except for the Dwarf varieties, corn is only suitable for a large garden.
Bush Beans	50-60 days	Plant successively, like lettuce—every 10-14 days	Keep the beans picked and the plants fertilized and they will bear for about 2 weeks.

Soil and Cultivation

Any garden plot should be dug over to a depth of six to ten inches or the depth of the blade of a spade or the maximum depth of tillage of a three to five horsepower rototiller. At the same time three to six inches of organic matter, and thirty to forty pounds per 1,000 square feet of commercial garden fertilizer should be worked in. (Spread the organic matter on the plot, broadcast the fertilizer over it evenly by hand, and turn the whole into the soil by spade or with a rototiller.) Rake the plot level with an iron rake, lay out rows with a line and open the rows with the end of a hoe.

Weeds should not be allowed to grow at any time during the season. Cultivate the entire garden about once a week or mulch between the rows. I prefer mulch since it (1) helps to supress weed growth by reducing seed germination, (2) reduces water loss by evaporation from the soil surface, (3) reduces soil temperature, thus promoting root growth and inhibiting the growth of nematodes.

The preferred mulching material for any garden is the organic material that is available either free or most cheaply in the area. Leaves, spoiled hay, straw, sawdust or wood shavings (used horse bedding with manure mixed in is excellent), all are useful. Peat has the disadvantage of high price and a tendency to shed water from the dried surface. Wood chips and the various ground or shredded bark products break down too slowly and must be removed from the plot periodically to allow digging, addition of organic matter and planting. The same criticism applies to stone chips and other inorganic mulches.

Tools

Our ancestors made do with a pointed stick. We need not be so primitive but neither do we need to be completely automated.

A spade or shovel, a spading fork, an iron rake, a hoe, preferably a lightweight one, and a garden line (twenty-five feet of clothesline with a stake at each end) are all that are essential.

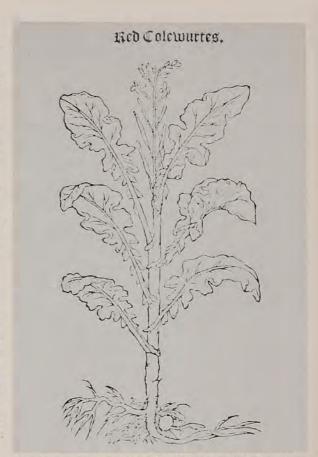
Pests and Diseases

We seem to have a fetish about cleanliness and freedom from disease. It is not necessary for survival that no leaf be chewed by insects or that no leaf be infected with disease. It makes sense to select varieties that are resistant to local disease problems. It is within reason to squash tomato worms under foot if your plants are being totally defoliated. It is not necessary to destroy every living insect in the garden. Healthy, well grown plants will resist disease. A clean garden, uncluttered by weeds, rotting fruit, and moldy, dying plants is a healthy garden.

Sources of Information

My article does not pretend to be a recipe for vegetable gardening everywhere. Bulletins suited to local conditions are available through the various State Agricultural Extension services. Besides these, there are a number of other publications of a general nature. The best of these contemporary sources of information that I know are:

Wester, Robert E.—Suburban and Farm Vegetable Gardens. U. S. Department of Agriculture, Home and Garden Bulletin No 9, Revised 1970, pp. 1-46. 40¢. Anon. Minigardens for Vegetables. U. S. Department of Agriculture, Home and Garden Bulletin No 163, Revised 1970. pp. 1-12. 15¢.



Brassica oleracea var. acephala. Collards or kale, from Lyte, A Niewe Herbal



Brassica oleracea var. capitata. The cultivated cabbage, from Lyte, A Niewe Herbal

McGourty, F., et al (eds)—The Home Vegetable Garden. Plants and Gardens 28(2): pp. 1-96. Summer, 1972. \$1.50.

Anon. Vegetable Gardening, a Sunset Book, Lane Magazine and Book Co., 15th Printing 1972, pp. 1-72. \$1.95. Includes cooking directions.

Doty, W. L.—All About Vegetables. Chevron Chemical Co., 1973, pp. 1-112. \$2.95. This is published in three editions—West, Midwest-Northeast and South. Includes cooking directions.

The Basic Vegetables

Brassica oleracea—The kales, cabbages, cauliflowers and broccolis "... There be divers sorts of Colewurts, not muche lyke one another, the which be al comprehended under two kindes, whereof one kinde is of the garden, and the other is wild. Agayne, these Colewurts are divided into other kindes, for of the garden Colewurtes, some be white, and some be red, and yet of them againe be divers kindes ... ". Lyte, 1578.

The kales, cabbages, cauliflowers and broccolis come of an old stock. They are, despite their seeming differences, closely related. They demonstrate clearly what simple selection, when pursued over a long period of time, can do. The wild cabbage, the progenitor of the lot, is a seashore plant ranging from northern Italy to the western coasts of Britain. It varies from a biennial to a perennial. In the perennial forms the stem base may, in time, become woody. It produces a (generally) unbranched stem which may reach three to four feet in height over a period of several years. At the top is a tuft of more or less succulent leaves: from the axils of these arise branching inflorescences.

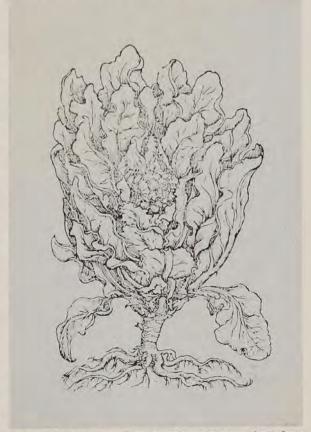
The young leaves of the wild cabbage may be removed singly from the plant and cooked as a pot herb. It is not, in fact, very different from the group of cultivated varieties which comprise the collards or tree kales. These produce an erect stem with a cluster of leaves at the top. Like the wild cabbage, individual leaves are removed and cooked, the plant thus producing greens over a long period. Alternately, the whole top may be removed and cooked. Seed may be sown early in the spring for a late spring or early summer crop—or sown in mid-summer for a late autumn or early winter crop. In the north these brassicas are perhaps most valuable as a late fall crop—but in more moderate climates in the south they will yield greens all winter.

The so-called kitchen kales seem to represent fixed juvenile forms of the preceding group. They are strict biennials. They also are grown for the leaves which are cooked as greens. They do not grow as tall as the true kales and some varieties will yield harvestable greens within thirty days of sowing—which make them valuable as an early spring crop. They are resistant to summer heat and to frost, so they are good for late fall greens as well.

The true cabbages are, along with the kales, very old vegetables. Although most of the classical references to "cabbages" seem to refer to leafy kale-like forms, there are a few references to capitate true cabbages. A form that is indistinguishable from a modern cabbage was illustrated in 1543 by Leonard Fuchs. At that time forms were grown with green leaves and with red leaves, globose forms and varieties with flattened tops, smooth-leaved forms and forms with blistered leaves—the Savoy cabbages.



Brassica oleracea var. gemmifera. Brussels sprouts, from Dictionnaire Practique D'Horticulture





Brassica rapa. The turnip, from Lyte, A Niewe Herbal . . .



Beta vulgaris. The wild beet, from Plenck, Icones Plantarum . . .

Cabbage may be started indoors for production of heads in late spring, or planted late for fall harvest. They require a rich soil with a pH of 6.0-6.5. They are more sensitive to frost than collards, kale, or brussels sprouts.

"... The Germans and other northern natives have a still more salutary and pleasant preparation, which they call sour-crout. With an instrument made for the purpose, they cut the heads off . . . (cabbage) . . . into small shreds and then lay them on a cloth to dry in the shade. They afterwards put these shreds into a common cask open at one end, and if it has contained wine or vinegar, it will be more favourable to the necessary fermentation: otherwise the inside should be rubbed with a little leven of old sour-crout. The cover of the open end should be strong, that it may sustain a large weight, and should have a handle fixed in the middle that it may be readily put on and taken off. A quantity of very fine sea salt should be procured, in the proportion of two pounds to twenty cabbages. A layer of this salt is first evenly spread at the bottom of the cask; on this is placed a layer of the shreds six inches thick. A man in strong boots, well washed and very clean, then gets into the cask, and treads down the mass till it is reduced to the thickness of three inches. Similar layers of salt and shreds of cabbage are put in and trodden down in their turn, till the cask is nearly full, but the last layer must be of salt. Some large fresh cabbage-leaves are then laid on, and covered with a wet cloth; and on the cloth is put the cover of the cask pressed down by heavy weights, to prevent the crout from swelling and rising during the time of its fermentation. A seasoning of either juniper berries, or, which is much better, of caraway seeds, is mingled with the cabbage, but not with the salt, and an empty space of about two inches is left at the top. The shreds are soon deprived of their vegetable juice by the pressure. This fluid, which naturally rises to the top, is green, turbid, and fetid, and is drawn off by means of a cock placed two or three inches below it. A new brine is then added, which also soon becomes foul, and is drawn off in the same manner. After these operations have been continued twelve or fifteen days, more or less, according to the temperature of the place, the liquor will remain clear and sweet; but care must be taken that there be always about an inch of the brine at the top, and that no space be left between the cover of the cask and the cabbage, which will otherwise acquire a putrid offensive smell. Sour-crout, well made, and well kept has a very pleasant acid taste, especially if it be washed after it is taken from the cask, and mixed, before it is served up, with a little vinegar. It has been found highly serviceable in long voyages, as a preservative from the sea-scurvy . . . " Rees, The Cyclopedia.

Brussels sprouts are a logical development from the true cabbages. Cabbage stalks frequently produce several sprouts (or small heads) after the original cabbage head is cut. In the brussels sprouts these axillary buds develop without the removal of the stem tip. The plant resembles one of the collards, with the difference that in the axil of each and every leaf a miniature cabbage head is formed. Surprisingly, they seem to be of very recent origin. They seem not to have been available in this country until 1828, and are not commonly mentioned in Europe for much more than forty years before that. They are strictly a fall and winter vegetable since they require three months or more from seed to production.

Broccoli and cauliflower are forms in which the inflorescences have been modified into organs for food storage. "... The third kind of white Colewurtes is very strange, and is named Flowrie or Cy-



Pastinacea sativa. The parsnip, from Lyte, A Niewe Herbal . . .



Daucus carota. The wild carrot, from Flora Danica

presse Colewurtes. It hath grayishe leaves at the beginning lyke to the white Colewurtes and afterwards in the middle of the same leaves, in the steeds of the thicke cabbaged, or closed leaves, it putteth forth many small white stemmes, grosse and gentle, with many short branches, growing for the most part allone height, thicke set and fast throng togither . . . " Lyte, 1578.

Both cauliflower and broccoli seem to have originated in the Mediterranean area. Cauliflower was grown in England by 1578, and was said to have come from Cypress. Little was said about the origin of broccoli, but it was called Italian cabbage or Roman or Naples broccoli.

Brassica napa—The turnip. " . . . The turnep taken in meat nourisheth meetely wel, so that it be moderately taken, and wel digested, but if a man take so muche thereof as may not be well digested, it engendreth and stirreth up much windynesse, and many superfluous humours in the body, especially when it is eaten rawe, for then it hurteth the stomache and causeth windinesse, blastings, and payne in the belly and small guttes . . . " Lyte, 1578.

Turnips are generally sown in late spring or early summer—in the north, late summer in the south, for a fall crop. Some varieties are adaptable for early spring sowing, particularly for the production of greens. People have strong feelings about turnips. Either they are very fond of them—or they find the flavor offensively strong. Most agree that the early greens are acceptable. For those who like them, the roots can be harvested in the fall and preserved for a period of time in a cool, moist, and frost-free location—such as a root cellar.

Beta vulgaris—The garden beet is a selection from a European plant native on the coasts of southern and western Europe. It ranges from Turkey to southern Sweden. The wild beet has three general groups of cultivated variants— the chards, which are cultivated for greens, the beets, which are cultivated for the swollen roots and the Mangel-wurzels cultivated for the swollen root and used for stock food.

Originally "beets" were valued only for the leaves which were used as a pot-herb, or, in other words, they were what is today called chard. There is a mention of a beet cultivated for an edible root as early as the 3rd Century A.D. However, it was not until the 15-16th Centuries that beets were at all commonly cultivated for their roots.

"There be two sortes of Beetes, the white and the red. And of the red sorts are two kindes, the one having leaves and root lyke to the white beete, the other hath a great thicke roote, and is a stranger amongst us.

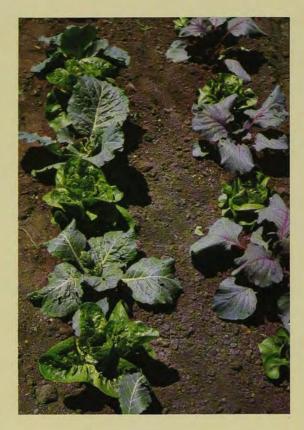
The white beete hath greet brode playne leaves, amongst the which riseth up (a) long crested or streked stalke. The flowers grow alongst by the stalkes one upon another, like little starres. The seede is rounde, harde, and rough. The roote is long and thicke, and white within.

The common redde beete is muche lyke unto the white, in leaves, stalkes, seede, and roote: saving that his leaves and stalkes are not white, but of a swart (dark) browne red color.

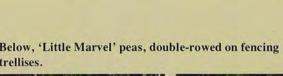
The strange red beete is like to the common red beete, in leaves, stalkes, seede, proportion, and color, saving that his roote is much thicker and shorter, very well like to a Rape or Turnep, but verry redde within, and sweeter in tast than any of the other two sorts . . . " Lyte, 1578.

On the continent beets with swollen roots and beets cultivated for their fleshy leaves (chard) had become distinct by 1670. The Mangel- (9





Left, cabbages interplanted with 'Summer Bibb' lettuces. Below, 'Buttercrunch' lettuces in the spring garden.





wurzel or "Root of Scarcity" a chard with a swollen root was introduced into England about 100 years later. This last is quite commonly grown as a stock feed.

In this country beets seem to be generally globose and red but in Europe elongate forms are common as well as forms with "white" or "yellow" flesh.

"The roots of the red beet are boiled, sliced, and eaten cold, by themselves, or in salads; are used as garnish to dishes, and as a pickle," Of the chard "the leaves (are) boiled as spinach, or put into soups, and the stalks and midrib of the leaf being stewed and eaten as asparagus . . ." Parkinson, *Paradisus*.

Beets seem not to do well in strongly acid soils. Sufficient lime should be added to assure a pH of 6.5.

Pastinaca sativa—The parsnip "... The roote of the garden parsenep eate in meates, as the Carrot, doth yeeld more and better nourishment than Carrot rootes, and is good for the lunges, the vaynes, and the brest...." Lyte 1578.

Parsnips are a crop for fall and winter in the north, and for early spring in the south. Soil for parsnips should be very deeply dug—twelve to fifteen inches is not too much—should be rich with a pH of about 6.5. Seed should be sown when the soil is warm. In the north, parsnips may be left in the ground all winter. If heavily mulched so that the ground does not freeze, they may be dug all winter. Parsnips seem to mature with the shortening days and cool temperatures of late fall and winter. It is "common knowledge" in New England that parsnips are not fit to eat until spring. However, according to that quintessential New England vegetable gardener, Burrage, "... they are best in November and December, but they are of good quality until the first of May."

Daucus carota var. sativa—The carrot "... Carrot rootes eaten in meates, nourisheth indifferently well, and because it is some what aromaticall or of a spicelike taste, it warmeth the inward partes, being eaten moderately: for when it is to muche and to often used, it engendreth evil blood...." Lyte 1578.

The cultivated carrot is directly descended from the introduced weed called Queen Anne's lace. By the older authorities, carrots and parsnips seem to have been confused. By the 1500's, however, both plants were known, grown, and distinguished. Carrots are an exceedingly hardy crop. They may be sown as early as the soil can be worked in the north, or grown as a winter crop in the south. In the north successive plantings at two to three week intervals will ensure a succession of harvests of succulent young carrots through the season.

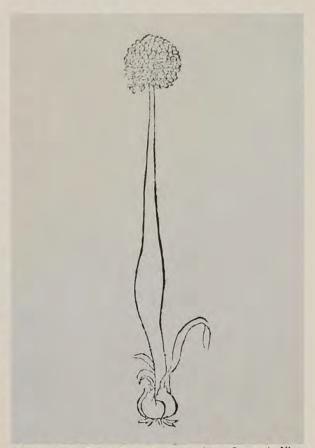
Allium cepa—The onion "... The Onyon engendreth windyness, and causeth appetite, and it doth scatter, and make thinne grosse and clammie humours, without nourishing: especially to be eaten raw. But being boyled twice or thrice it is nothing so sharpe, and it nourished somewat, but not muche...." Lyte 1578.

Onions, in essentially their present form, have been cultivated since ancient Egyptian times. Hippocrates mentions their cultivation in Greece in his time (about 400 B.C.). They were common in Europe during the Middle Ages—but, it appears, as a flavoring, rather than as a vegetable in their own right.

Onion seed can be started indoors, in the north, or the seed may be sown directly in the row as soon as the soil can be worked in the spring. The development of the bulb is triggered by day-length. In the north the varieties generally grown require fourteen to fifteen hours of daylight to begin bulb development—or the amount of daylight ob-



Daucus carota. The carrot, from Lyte, A Niewe Herbal . . .



Allium cepa. The cultivated onion, from Lyte, A Niewe Herbal...



Phaseolus vulgaris. The garden bean, from Lyte, A Niewe Herbal . . .



Allium porrum. Leeks, from Lyte, A Niewe Herbal . . . 12

tained in May and June. The extra early winter sown onions are triggered to make growth by about twelve hours of daylight. So grow varieties appropriate to your area!

Allium porrum—leeks "... Leekes engender grosse and evill blood, breede winde, and cause hevie dreames, especially to be eaten raw; but boyled in water twice or thrice, it wil be the better and more convenient to be eaten...." Lyte 1578.

Leeks are a long season crop, planted in spring in the north to be harvested in the late fall—in late summer in the south for spring harvest. In the north, if they be heavily mulched, so that the soil does not freeze, they may be harvested all winter. Leeks seem not to be well known in this country. They are milder in flavor than onions, and can be used for most of the same purposes.

Phaseolus vulgaris—common bean, kidney bean. "... After the flowers there come in their places long coddes (pods) which be sometimes crooked, and in them lye the sedes or fruit, smaller than the common bean (broad bean, faba bean) and flat fashioned lyke to a kidney of colour sometimes red, sometimes yellow, sometimes white, sometimes blacke, and sometimes gray, and speckled with sundrie colours. This fruit is good and pleasant to eate, in so much that men gather and boyle them before they be ripe, and do eate then coddes and all...."Lyte 1578.

Our common bush and pole beans are indigenous American products. The earliest settlers found the Indians cultivating them, and they soon were wide-spread in Europe. In our mania for breeding uniformity in our crops, we have lost the colors from the seeds, which is a pity. Among gardeners there is a mystique about pole beans which avers that they have a "better" flavor than bush beans. This will not stand up to test. The one advantage that pole beans do have is that an individual plant will bear for a much longer period of time than a given bush bean plant. However, pole beans must be staked up, or supported in some way. For many gardeners they are just too much trouble to bother with. On the other hand, a given plant of bush beans bears the best of its crop over a period of about two weeks. To have bush beans producing over a long period it is necessary to have a succession of plantings at roughly two-week intervals.

Zea maize—corn " . . . In new England, corn was mentioned in 1605 by Champlain, who saw it in cultivation by the Indians at the mouth of the Kennebec. At Cape Cod, a little later, he saw fields of corn and also fields lying fallow. He mentions the method used for storing to be in pits dug in sand on the slopes of the hills, into which the large grass sacks of corn are stored and then buried. In 1620, Miles Standish, exploring for the Pilgrims, found the fields in stubble for it was November and finally under the heap of sand "newly done: we might see how they paddled it with their hands", a find, great, new basket, full of very faire corn, of this year, with some six and thirty goodly ears of corn, some yellow and some red and others mixt with blue.' In 1629, Higginson says, 'There is not much greate and plentiful eares of corne, I suppose, any where else to be found but in this country; because, also, of varietie of colours—as red, blew and yellow, etc.,: and of one corne there springeth four or five hundred.' Josselyn says, 'Indian wheat, of which there is three sorts, yellow, red and blew. The blew is commonly ripe before the other, a month.""

"The history of the appearance of sweet corn in gardens shows it to be quite modern. In the *New England Farmer*, Aug. 3, 1822, it is said, 'a writer in the Plymouth paper asserts that sweet corn was not known in New England until a gentleman of that place, who was in Gen. Sullivan's expedition against the Indians in 1779, brought a few ears to Plymouth, which he found among the Indians on the border of the Susquehannah.' A writer the following September adds that this sweet corn was brought by Lieut. Richard Bagnal from Gen. Sullivan's expedition against the Six Nations in 1779 and was called papoon corn. 'That was the first of the species ever seen here and has since that time been more and more diffused; and, I believe within a few years only, has been generally and extensively cultivated for culinary purposes. The species has undergone some change since it was first introduced—then the core was a bright crimson, and after being boiled and the corn taken off, if the corn was laid in contact with any linen, it communicated an indelible stain. This inconvenience has disappeared. This species, also, like what is distinguished by the appellation of southern, or flat, corn, by repeated plantings here, assimilates it to our local corn.'" Hedrick.

Sweet corn, at best, takes up a great deal of room for a rather small return. Standard varieties take up too much room to be considered practical for the small garden. There are, however, a number of "midget" varieties which are not only smaller in stature but also require a shorter period to come to maturity than the larger varieties.

Lycopersicon esculentum—The tomato. "Some persons cultivate these plants for Ornament, but their leaves emit so strong offensive an Odour on being touched, which renders them very improper for the Pleasure Garden, and their Branches extend so wide and irregular, as to render them unsightly, for they cannot be kept within bounds, especially when they are planted in good Ground . . .

The *Italians* and *Spaniards* eat these apples as we do Cucumbers, with Pepper, Oil and Salt; and some eat them stewed in Sauces, etc., and in Soups they are now much used in *England*, . . . " P. Miller 1759.

Tomatoes like neither frost nor very hot weather. They are subject to whitefly, nematodes, and various forms of blight and wilt diseases. They are also profligate with their fruit. A dozen plants will supply a family of four or five persons with sufficient fruit both for current eating and preserving. Tomatoes should be staked up in some way to keep the fruit off the ground. They can be tied to a stake or woven into a fence. They should also be mulched. They can be treated as pot plants, provided that their insatiable greed for water can be satisfied.

Curcurbita pepo—The summer squashes, vegetable marrows (zucchinis) and pumpkins. "The bush crookneck is also called a squash. Notwithstanding its peculiar shape and usually warted condition, it does not seem to have received much mention by the early colonists and seems to have escaped the attention of the pre-Linnean botanists, who were so apt to figure new forms. The most we know is that the varietal name Summer Crookneck appeared in our garden catalog in 1828, . . . " Hedrick.

The true squashes, like the beans and corn, seem to be indigenous American productions. The winter squashes, cucumbers, and pumpkins have no place in the small garden—but the bush types, with fruits of various shapes, are eminently suitable. While the yellow crookneck is the traditional New England summer squash, the vegetable marrows, bush selections made in Europe, have been becoming popular within the last fifty years. The marrows (or zucchinis) seem to be very vigorous plants, and relatively disease-free. They have the advantage over the summer crooknecks, that their fruit remains palatable to a much larger size. \bigotimes



Zea mays. Indian corn, from Lyte, A Niewe Herbal . . .

AN IMPATIENS circus

the LONGVVOOD New Guinea hybrid impatiens

Robert J. Armstrong*

An expedition was being planned to the island of New Guinea. It was the summer of 1969 and plans for another U.S.D.A.-Longwood cooperative plant exploration trip were finalized. Lists of ornamental plants to be sought had been compiled from the requests of various researchers throughout the U.S.A. Conferences were held between Longwood Gardens and the U.S.D.A. plant explorers Harold Winters and Joseph Higgins. As usual, cuttings, seeds, bulbs, rhizomes and whole plants would be collected and shipped by air to the United States to the Plant Introduction Station at Glenn Dale, Maryland.

Among these new plants were to be a number of impatiens cuttings and seeds which would develop into plants unlike any that had generally been known before. These plants were destined to become known as the "New Guinea impatiens."**

As usual, Longwood Gardens received a share of the propagations of all plants collected which might prove to be of value to the gardens. Admittedly, the first look at the impatiens was not exactly overwhelming. This was partially due to greenhouse culture. We decided that the performance of these plants should be observed growing outside. Partial shade was used at first to get them started, but we found that generally this was not necessary. Plants were allowed to have full sun with what turned out in some cases to be spectacular results. Variegations in the leaves which had not been apparent in the greenhouse appeared. Plants which were spindly in the greenhouse grew into compact bushes and most of them did not seem to mind the sun. It should be noted that later observations have shown that many of these plants look their best if they are given a small amount of shade.

After observing the performance of these plants in the field, we decided to move some of the more showy ones as whole plants into the greenhouse before frost. The others were propagated as cuttings. The performance of these plants during the winter was very impressive. Those plants that had not flowered at all, or very little, suddenly burst into a shower of scarlet and crimson color. It seemed that we had some sort of short day plants. Later work indicated that they



Impatiens cultivar 'Bozo'.

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**Refer to the Fall, 1973 (Vol. 52, No. 3) issue of American Horticulturist for Harold Winter's article on the Impatiens collection.



Impatiens cultivar 'Carousel'.

seem to be more affected by temperature than day length. Some of them did flower in the summer but had white or lavender flowers on erect spindly plants.

We decided to initiate an impatiens breeding program as soon as flowering plants were available to make the necessary crosses. Not knowing what to expect or having any ideas as to what crosses to make we decided on a so-called shotgun approach. We would make as many crosses in as many ways as possible among these various plants.

Crossing continued during the winter of 1971-72. We planted seeds as soon as they matured. By the time of field planting there were about 700 new F₁ seedlings. Most of these flowered that summer (1972) and many appeared promising as colorful blooming bedding plants. Others exhibited variegated croton-like foliage. Some of the flowers were pastels, others were brilliant scarlets, pinks, and crimsons. Some were two and one-half inches or more in diameter.

With elimination of the less desirable ones, crossing continued during the winter months of 1972-73. Eventually we produced 3,000 more hybrid seedlings from crosses among the F_1 's developed the previous winter and from back crosses with the original cultivars from New Guinea. We grew these outside in the summer of 1973. Several of them, in addition to several from the previous summer, have been selected and named for introduction and further trials.

Presently Longwood Gardens is distributing to its cooperators ten different cultivars with more to be added in the future. These will be tested under many different conditions in order to evaluate them more fully. These and others developed by various workers should be available to the general public in the not too distant future.

The names and descriptions of these cultivars are as follows:

'Bozo,' L.G. 72736. A sparingly flowering, compact herb; stems deep purple-red; leaves dark green with reddish midveins, smooth; flowers 1½ in. in diameter with upper petal separate from four overlapping lower petals, bright scarlet



Impatiens cultivar 'Harlequin'.



Impatiens cultivar 'Cotton Candy'.

R.H.S. Fan 1, 43 A-B. This impatiens is introduced because of the striking color contrast between the brilliant scarlet flower and the dark foliage. The colors are very definitely those of the Christmas holiday season.

'Carousel,' L.G. 72737. A sparingly flowering, compact, spreading herb; stems red; leaves with red midveins, bases and centers yellow-green, margins dark green, somewhat concave and bullate; flowers 2½ in. in diameter with petals overlapping but distal half of upper petal separate, bright orange-red R.H.S. Fan 1, 40 A. This impatiens is introduced because of its very compact habit and striking variegated foliage.

'Harlequin,' L.G. 72738. A few flowered, compact, upright to spreading herb; stems red; blade bases and centers pale yellow more or less suffused red and with red veins; margins very dark green, smooth; flowers small 1½ in. in diameter, dark red R.H.S. Fan 1, 45 B-C with petals overlapping. This plant is introduced because of its very striking multicolored, variegated foliage.

'Cotton Candy,' L.G. 7336. A floriferous spreading herb; stems and petioles purple-red, leaves dark green with reddish impressed veins; flowers 2½ in. in diameter with upper petal separate; flowers soft pink R.H.S. Fan 1, 55 C, with darker midveins. This plant is introduced because the soft pink flowers set against the dark reddish leaves presents an extremely pleasing display, either as a single plant or in a mass planting.

'Lollipop,' L.G. 7337. A floriferous spreading herb; stems green; leaves medium to dark green, smooth; flowers 2½ in. in diameter with petals overlapping, flowers bright orangepink R.H.S. Fan 1, 43 C-D with orange cast, bases of petals with filaments white. This plant is introduced because of its ability to produce a superb floral display. The flowers are large, flat, round and have an iridescent salmon-orange color that must be seen to be appreciated.

'Big Top,' L.G. 731030. A floriferous upright herb; stems green; leaves medium to dark green, slightly bullate; flowers 2½ in. in diameter with all petals overlapping; petals pure white. This plant is introduced because it is by far the best white impatiens to be developed at Longwood Gardens from the New Guinea collection. The plant when in full bloom literally covers itself with large flat round white flowers.

'Charmer,' L.G. 731031. A floriferous upright to spreading, loose herb; stems green suffused red; leaves dark green with veins impressed; flowers $2\frac{1}{2}$ in. in diameter with petals overlapping; petals orange R.H.S. Fan 1, 30 B-C with red marks at bases of lower petals; filaments orange-red. This impatiens is introduced because of its unusual color which is soft pinkish orange, its ability to flower under higher summer temperatures and its vigorous growth.

'Orange Crush,' L.G. 731032. A very floriferous, very spreading herb; stems green, also petioles; leaves medium to dark green, somewhat bullate; flowers 21/4 in. in diameter;

Impatiens cultivar 'Charmer'.





Impatiens cultivar 'Orange Crush'.



Impatiens cultivar 'Big Top'.

Impatiens cultivar 'Lollipop'.





Impatiens cultivar 'Stop Light'.

upper petals separate from lower four overlapping petals; petals bright orange R.H.S. Fan 1, 28 A-B; lower petals markingly rose-red at bases. This impatiens is introduced because of its strikingly bright orange flowers, its very floriferous flower habit, even under high summer temperatures and its very vigorous growth.

'Painted Lady,' L.G. 731033. A very floriferous, compact, spreading herb; stems and petioles reddish; leaves dark green, nearly smooth; flowers 2 in. across by 2¼ in. high; upper petals separate from lower four overlapping petals; petals pinkish-white flushed pink R.H.S. Fan 1, 52 C-D on distal halves, filaments red R.H.S. Fan 1, 52 A. This impatiens is introduced because of its extremely floriferous habit. It seems to be covered with flowers under any and all conditions. Its somewhat pendulous habit makes it a desirable plant where there is reason to partially cover the container. The pale-pink flowers are borne both at the tips of the shoots and down in the interior of the plant, giving the plant more depth than is found on most impatiens.

'Stop Light,' L.G. 731034. A rather loose floriferous, spreading herb; flowers 2½ in. in diameter with all petals overlapping; petals bright glowing scarlet close to R.H.S. Fan 1, 40 A, with deep rose on whitish marks at bases of lower petals; stems and petioles red, blades dark green with veins impressed. This impatiens is introduced because of its very striking fiery red, flat round flowers that cover the plant when in full flower.

The culture of these plants is simple. All of them will grow well in full sun and most will grow in partial shade. Those with variegated foliage show the best coloration under high intensity light conditions, but there is a tendency for the lighter toned parts of the leaves to scorch under these conditions. A well drained, slightly acid to neutral growing medium with moderate levels of nutrients is satisfactory. The best greenhouse temperatures seem to be 55-60° F. nights and 70-75° F. days.

Propagation is easily done by cuttings in a mist bench. Cuttings can also be rooted in water. Distilled water seems to work better than tap water for some unknown reason.

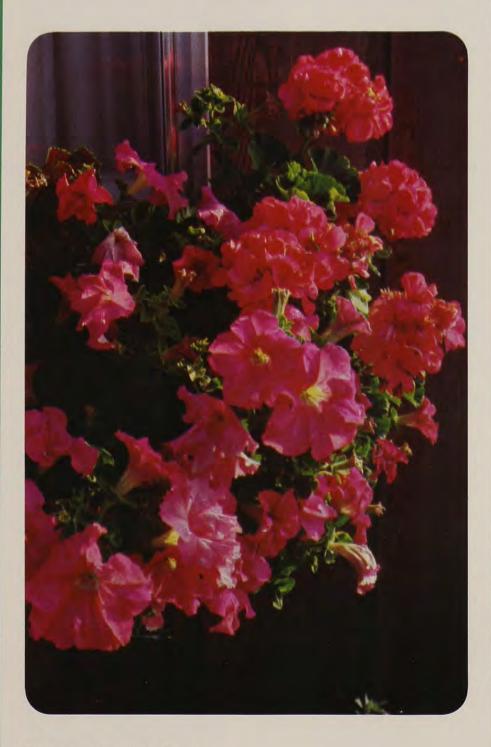
The reluctance of some of these plants to flower during the midsummer months does present a problem. We hope, and there is evidence to indicate, that this problem can be eliminated through breeding. This, of course, is not a problem for those cultivars grown for their foliage alone.

Research at Longwood Gardens indicates that the initiation of flower buds in these New Guinea impatiens is not controlled by a simple single factor. Cool temperatures seem to be the most important environmental factor in initiating flower buds. Short days also appear to hasten the formation of flower buds. Those that do flower well in the heat and long days of summer, flower even better in the cooler shorter days of fall.

We hope that the introduction of these cultivars will stimulate interest in these plants, thereby promoting their use in the home garden and to further research by other individuals and institutions.

Let Nature Work in the Seedflat

Neil Sperry*



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Petunias don't start in a peat pot! A plant actually starts with a seed: we pampered American gardeners sometimes forget that we can grow a plant from a seed. It's the natural way, you know.

Growing plants from seed is a snap (or a zinnia or a marigold) nowadays! With new hybrid seeds, highly refined germinating mixtures. and a wealth of knowledge at our green-thumbtips, every gardener can succeed. Growing your own plants from seed offers you the flexibility of trying anything you see in a seed catalog, not just what your local nurseryman chooses to offer for sale. Plants started indoors weeks ahead of the proper planting time outdoors lets you control the plants' first weeks far more closely than might be possible by sowing directly in the great out-of-doors.

"Seed" is the first word in gardening, and all else that follows can be no better than the seed vou've chosen to use. Fortunately for us, modern seed producers have packaging down to a science. Seed from these reputable dealers comes packed in paper, foil, and plasticdry and eager to sprout. Always buy from a known source.

Once fresh seed arrives at your house, sow it promptly. If you need to store it, keep it cool (40° F.) and dry. While some seed still germinates years after harvest, it does lose vitality as the months tick away, regardless of storage techniques. If you have stored seed from last year, better run a germination test before planting. Lay several seed on a moist paper towel, fold it over, and wait several days to note changes. If germination is low, look for fresh seed. Seed is the biggest bargain in gardening, even the seemingly expensive quarter-each philodendron seed and the dime geraniums. Seed still is the cheapest way of starting any seed-producing plant.

One word of warning: don't let the prices of new and wonderful hybrid seed scare you. Hybrid seed is the result of carefully controlled crosses between known parents. 19 Results are outstanding with yields of flowers or vegetables far exceeding either parent and even other inbred varieties. Due to the research and hand labor involved, hybrid seed is more expensive than inbred, often by four to six times. But the difference in a one-fifth cent seed and a one penny hybrid seed soon becomes negligible when you rake in an extra seven pounds of tomatoes. Hybrids are good business.

So seed is where it all begins. Now let's take a look at what we can do to squeeze the most out of that seed packet.

Germinating Mixes

Seedlings are a lot like small children; they need the best possible surroundings to turn out properly. And the "soil" mix you choose for your small plants will do more toward affecting their ultimate prosperity than any of the other environmental variables.

Good drainage with adequate water-holding capacities, freedom from devastating insects and diseases, and good workability are all prime considerations in selecting a germinating mix. Certainly there are natural soils in this world that would qualify fully, but chances are slim

that such soil is laying around your garden. Many soils are just too variable, too polluted with pests to be practical for starting seed indoors.

This leads us, then, to the array of soil substitutes. With a dozen or two members on the team, your choices of combinations stretch almost to Endless. Commercial seed propagators generally use mixtures of finely shredded (milled) sphagnum moss, fine grained vermiculite, or fine grained perlite, or both vermiculite and perlite. Sand is also a frequent constituent, but even it varies from town to town.

Many garden centers currently handle pre-packaged planting mixtures ready to be emptied into a seed flat as is. You can also prepare your own mix by running standard sphagnum peat, vermiculite, and perlite through a fine meshed screen or through hardware cloth. Aim for a final mix of roughly half perlite, or vermiculite, or a mixture of the two. Assuming you've stored your raw materials carefully, such a mix will be free of harmful pests and ready for sowing.

Planting Containers

Take your choice when it comes to containers for sowing seeds. A

container needs drainage holes, and it ought to be reasonably shallow. A shallow pot, a small wooden flat, or a cut-off milk carton will do. Place the prepared soil mix into the container, smooth and pack it lightly, and sprinkle it moderately.

Sowing the Seed

Annual flower and vegetable seeds behave differently. Chart I shows how size, rate of germination, and relative cost of seeds can vary so widely. This variability will do much to determine your seed-sowing techniques.

Be patient when planting seed in a seedflat. Sow carefully. Sow thinly. Overplanting means crowded seedlings that soon become spindly and difficult to transplant. Sowing in rows makes transplanting far easier and reduces spread of damping-off and other diseases through the entire planting. Leave small seeds (smaller than a pin head) uncovered on the soil surface. Cover larger seed, but not deeply. A rule of green thumb would be to cover seed no more than two times its thickness. Use the same sowing mix, sprinkled gingerly, as top-dressing material.

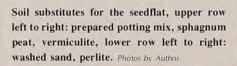
Moisten planted seed lightly with a mist nozzle, fine sprinkler head, or

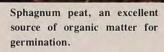


Seed variability: size

Grevillea robusta Silk Oak, larger

Iberis umbellata Candytuft, smaller.

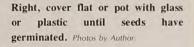


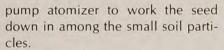






Above, sowing the seed-tap lightly, sow thinly in rows. Do not cover seed smaller than pin head with soil mix.





Label each lot of seed as soon as it is sown. Be especially careful in labelling flat mates of the same species, different colors. Include on your label variety, sowing date, and other pertinent facts you want to recall in future plantings.

Cover the seeded and watered pot or seedflat. Either a sheet of glass or a piece of polyethylene wrap will suffice since both are air tight and transparent.

Care of Small Seedlings

Seed coats are popping! Germination has begun. The seed has shown its willingness to fulfill its part of the bargain—now it's your turn.

Observe your seedlings regularly. Keep covered flats and pots in a bright spot, but out of direct sunlight. Once seedlings are up and growing remove the cover and toughen them for the world to come. As the cover is taken away humidity and soil moisture are reduced. Small plants with small root systems won't tolerate prolonged droughts, so check frequently and water when necessary.

Damping-off of your seedlings, a

Right, allow young seedlings plenty of growing room, as these young snapdragons.

Right below, transplant early, hold seedlings by leaves, not stems.



stem rotting disease caused by the fungi Pythium and Rhizoctonia, can be a real heartbreak to even the most dedicated plantsman. Avoid disease-encouraging high humidity by allowing the plants' leaves and stems to dry quickly after watering. Chemical controls for damping-off include Captan and Dexon.

Light and temperature are prime considerations for the seedsprouting gardener, particularly if he is working indoors. Most seedlings need at least 1,000 foot candles of light (shadow on plants when hand passed over) to grow stout and strong. For most of us with roofs on our dwellings, that means we'd best move the plants near a south or east window. Fluorescent tubes work well, provided they supply ample quantities of light. Run them twelve to eighteen hours per day for the best results.

Germination is good at 68-70° F. for most annual flower and vegetable seed. But you will soon want to reduce the temperature to 60-65° F. to keep your plants compact and stocky.

Since young seedlings grow rapidly, soon becoming too large for their surroundings, fertilizers probably won't be needed until trans-



planting. For slower growing species an infrequent dilute dose of a liquid balanced fertilizer should keep them coming.

Transplanting and Growing the Seedlings

Transplant young seedlings at the earliest possible moment. Roots reestablish quickest when plants are still small. As soon as your fingers can grasp the seedlings' leaves, start transplanting. Keep your fingers off the stems lest you injure them and invite insects and diseases into the planting.

Modern ingenuity leaves us gardeners with a couple of dozen ways to grow our seedlings on. Certainly individual clay, plastic, or peat pots are excellent so long as they are not so large that soil remains wet too long. Compressed peat pellets (Jiffy 7's) that expand in water are becoming increasingly popular. You can even innovate your own containers out of paper cups or egg car-

Since you will transplant your seedlings while they're still quite small and tender, stay with the same general soil mix you used in the seedflat. Fill the containers level full of lightly packed soil and sprinkle. 21 Make a small hole with a pencil and place the seedling in at the same depth it was growing in the seedflat. Firm the soil around the stem and water again. Learn to work quickly when transplanting anything, but especially tiny seedlings. Save extra unplanted seedlings for future replacement.

Care of tiny transplanted seedlings is not a special problem since it won't vary much from care of the plants in the seedflats. Give the plants the most light possible. Keep them on the cool side for husky specimens. Water carefully, particularly in the tiny seedling stage. Fertilize the actively growing plants occasionally. Above all, avoid overcrowding.

Planting Them Out

Once spring days have come to stay, be ready to move your young plants into their out-of-doors home. Prepare the new surroundings to receive them. Till or spade in organic matter, rake out any debris or weed roots, and smooth and level the soil before planting.

Make sure your plants are ready for the big jump. Don't put them out just as forecasters are calling for cold, frosty nights or windy, desiccating afternoons. Be cautious of moving them from shaded surroundings directly into the sun's full fury. Remember that first sunburn we get each spring and think of your tender young plants. Condition them gradually by letting them spend a day or two in a halfway-house setting (back porch, summer house) prior to planting.

Once your annual flower and vegetable seedlings are planted, and pinched, nature will take major control of their progress. Which reminds us again that growing plants from seed is the original, the natural way of plant propagation.

CHART I

VARIETY	SEED/OUNCE	GERMINATION RATE (DAYS) at 70°	AVERAGE COST EACH IN 1000 LOTS
Dianthus 'Bravo'	25,000	7	.225¢
F ₁ 'Snowflake'	25,000	7	2.5
Marigold Crackerjack Mix	9,000	7	.1
F ₁ Hybrid Mix	9,000	7	.9
Pansy Steele Jumbo Mix	20,000	10	.35
F ₁ Majestic Giant Mix	20,000	10	.8
Petunia F ₂ Mix	285,000	10	.065
F ₁ Grandiflora Mix	285,000	10	.375
Snapdragon Tom Thumb	180,000	12	.035
F ₁ Floral Carpet	180,000	12	.5
Zinnia 'Blaze'	3,000	7	.3
F ₁ 'Firecracker'	3,000	7	1.7
Tomato 'Beefsteak'	9,000	7	.05
F ₁ Burpee 'Big Boy'	9,000	7	.9

SEED VARIABILITY: Seeds vary in size, rate of germination, and relative cost. Higher costs of many hybrid seeds are quickly returned through increased yields.



Many containers are available for growing plants.

Right, small phlox off to a great start in a peat box.



A nice catch of windowsill-grown pansies, ready for the garden. Photos by Author.

GERMINATING MIXTURES

Germinating media vary in the nature of their ingredients. Some are entirely or partially free of soil. Others are soil based. All have been developed with the idea of reducing the chances of damping-off and other seedling diseases while providing satisfactory conditions for seed germination and seedling growth. A good seed germinating mixture should be quite porous, retentive of moisture but never soggy, and free of foreign organisms that might prove harmful to seedlings. The English gardener often depends on media developed by the John Innes Institute, a soil research organization, for best results. The Innes media are known as "composts" and the John Innes germinating compost is widely favored by amateur and expert growers alike. In Europe home-type soil pasteurizing units are available, and the additives for various John Innes composts can be bought pre-measured at garden shops. In America gardeners have to begin from scratch and contrive their own pasteurization methods. An easy way is to choose a clean clay bulb pan or azalea pot that fits easily inside a large kettle when placed on three inverted three-inch pots. Soil to be pasteurized is poured loosely into the pot, water is placed below it, the cover goes on the kettle, and the steamer is ready to be set over a stove burner.

The Cornell Mix
Vermiculite (Terra-lite), #2 grade, or equivalent
For 1 bushel 4 gallons
For 1 cubic yard 11 bushels
Shredded Peat
For 1 bushel 4 gallons
For 1 cubic yard 11 bushels
20% Superphosphate (powdered, not pelleted)
For 1 bushel 4 tablespoons (level)
For 1 cubic yard
Ground Dolomitic Limestone
For 1 bushel 8 tablespoons
For 1 cubic yard 10 pounds
Add ONE of the following—NOT BOTH
33% Ammonium nitrate
For 1 bushel 4 tablespoons
For 1 cubic yard 3 pounds
or
5-10-5 Fertilizer
For 1 bushel 1 cup
For 1 cubic yard 12 pounds
Note on use: This mixture is satisfactory for many
sorts of plants; foliage plants do best when the fertilizer
is ammonium nitrate, flowering plants and seedlings
thrive on the mixture fortified with 5-10-5 fertilizer.

Loam, Peat and Sand Mix (parts by volume)

Garden loam	1	part
Coarsely granulated brown peat	1	part
Sharp sand	1	part

Note on use: Mix, moisten, and allow to mellow overnight. The nutrient value of this depends on your garden loam. Some gardeners add one-half cup of steamed bonemeal per bushel which acts as a buffer, releasing calcium ions as acidity builds up and supplying phosphate for healthy roots. If pathogenic fungi or nematodes are a problem in your garden your loam should be sterilized chemically or pasteurized as described below.

The North Platte Mix (all parts by volume)

rial is available in the germinating mixture.

Milled sphagnum moss I part
Perlite, #2 horticultural grade 2 parts
Vermiculite (Terra-lite) #2 grade 2 parts
Note on use: Mix thoroughly, moisten slightly, and
allow to temper for a few hours or overnight before
sowing seed. Within a week or two begin applying very
dilute, complete liquid fertilizer as little nutrient mate-

John Innes Germinating Compost (parts by volume)

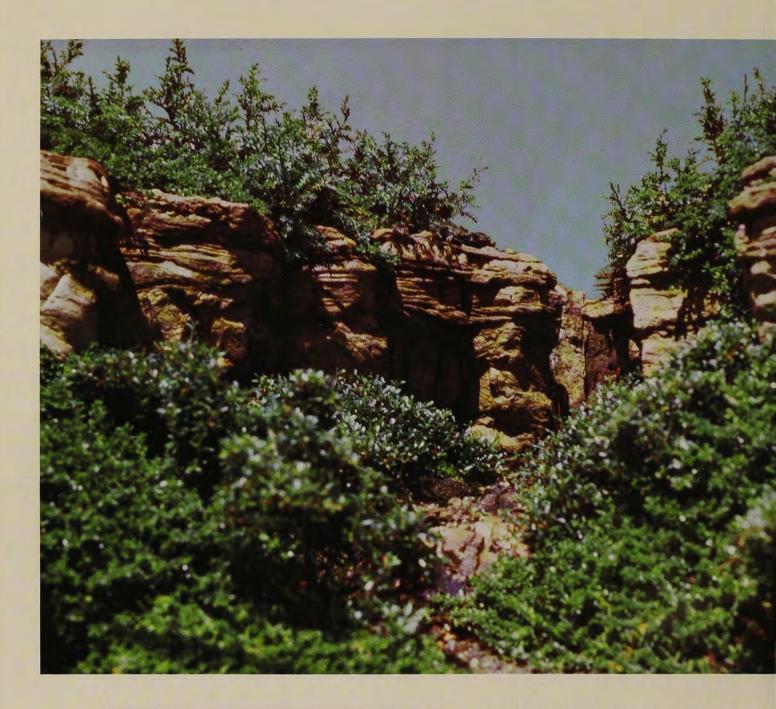
Pasteurized loam	2 parts
Coarse (European) peat	1 part
Coarse sand	1 part

Add to each bushel of the above mixture

34 ounce ground limestone

1½ ounces 20% superphosphate (granulated, not pelleted)

Note on use: John Innes germinating compost is suitable for almost all sorts of seeds. For ericacious species omit the ground limestone. Loam should be a fibrous material (composted sod is excellent); run through an eighth-inch mesh sieve and shake over a finer screen to remove dust particles. Treat peat and sand the same way. The idea is to discard all fine particles that choke drainage. To pasteurize loam, sieve it when barely damp, place in a steamer, and heat with live steam to 180° F. Hold at that temperature for ten minutes, then spread the soil on a clean surface to cool quickly. Pasteurization destroys pathogenic soil organisms but does not remove all beneficial soil organisms and it reduces excessive hydrolysis of insoluble soil ingredients that is common with longer heating or higher temperatures as used for sterilization. As John Innis composts are not sterile, they also are not stable, and should be used within three weeks. @





Photos supplied by Author.

The Snyder miniature landscapes are not labeled, according to Mr. Snyder's philosophy of these unique microenvironments. The larger photo is a walk-in view shot in the miniature landscape shown in the smaller photograph.



Nature in Miniature*

Microenvironmental design is the creation of miniature landscapes. Professor Snyder has drawn from the classic oriental techniques used to dwarf woody plants and to assemble tiny dish gardens, but he has gone further. He has, essentially, created recognizable habitats *en toto* in miniaturized form.

The inspiration comes from nature; the materials used to reconstruct an environment, in greater part are taken directly from nature. In a loosely structured class at M.U. Mr. Snyder teaches his students the basic principles of designing small-scale "ecosystems." The students then have free reign to build their miniature habitats—anything from a Missouri Ozarks cliff and its creek to a wind-swept tree on a rocky ledge surrounded by the rugged terrain of the Colorado Rocky Mountains.

There are cogent reasons for developing a capability to reconstruct the land-scape in miniature form. Materials for the job usually are readily available. Microenvironment gardening fits into the average home. It is an inexpensive undertaking (depending on the complexity of the system—moving water being a costly addition). Miniature landscapes displayed in the home are beautiful in themselves—more than mere conversation pieces, they can be works of art if done skillfully. And, finally, the analyzing and reconstruction of a habitat in miniature is instructive; the gardener gains a fuller awareness and appreciation of the intricacies and processes of the environment.

Professor Snyder imposes two restrictions on his style of building microenvironments. Everything must relate to the forms, features, and forces of nature, and one or more of the basic elements of a natural landscape—rock, earth, plants, and water—should be used. Professor Snyder recommends the use of rocks in miniaturized ecosystems. He feels that rocks, which in nature form the support for overlying soils, should also become the underpining of a miniaturized landscape. Rocks, properly used, give the appearance of age to the composition.

Rocks

Use your eyes when you go out on a rock-hunting expedition seeking materials for your microenvironment. Observe how at that place the local stone appears in the landscape. Try to reason out the geology of the area, and, understanding how the skin of the earth is constructed, you will gain considerable insight into how best to reproduce it with local materials in miniature form. Obviously, rocks are an integral aspect of a local environment. They are involved in color, texture, contour, and line.

The best rocks on which to plant dwarfed plants are those with rough surfaces. Volcanic rocks with cavities in them are excellent (but scarcely suitable for reproducing a terrain that is meant to resemble a granite mountainscape.) Rocks gathered near the sea must be soaked in repeated changes of water for several months to remove plant-killing salts.

*by Miss Sherry Carson, reporting on an interview with Mr. Leon Snyder, Associate Professor of Horticulture at the University of Missouri, Columbia, Missouri 65201



The size of rocks you select for your microenvironment depend on the proportions of the miniaturized landscape in your mind's eye. Professor Snyder, with a view toward practicality, suggests that you always bear in mind how far a batch of rocks will have to be carried, and recalls one ardent neophyte designer who lugged a handsome rock weighing some twenty pounds half a mile down a rocky creek bed on a hot, humid day. It may pay to make rock collecting a family endeavor.

Within a single composition, rocks should match in texture, stratification, and color, just as they do in nature. Rock garden experts learned long ago not to build a rock garden with a vacation collection of assorted stones dumped at random in a heap. The same thing applies to miniature landscapes; follow the full scale scene and duplicate its characteristics in miniature.

Soil

Soil is the next consideration in assembling a microenvironment. A safe rule in choosing soil for a miniaturized planting is to duplicate as closely as possible the soil found in the actual habitat. But substitute soils may be created. Criteria are granular nature (free of dust) for fast drainage and good aeration, and reasonable fertility. Professor Snyder makes free use of twice sifted loess soil from the nearby Missouri River bluffs. This grainy, wind-blown soil seems ideal for miniaturized landscapes.

You will need to stir up a batch of mud or muck to mold land contours over, under, and around the rocks in your landscape. Course builder's sand and peat are mixed with the soil slurry to thicken it, and you can add water to thin it where a runny consistency is desirable.

Plants

Your choice of plants for a miniaturized landscape is critical. An obvious point is habitat consistency; don't mix desert cacti with a deciduous woodland group of trees; reserve the miniature weeping willow-form for your boggy miniature, never plant it on what is supposed to be a windswept mountain crag. You will have to substitute. If you are doing a miniature spruce covered cliff for indoor growing, an indoor type evergreen probably will have to replace the spruces. But match form, texture, and color as closely as possible.

This brings us to the business of dwarfing plants. This is a huge science—an exacting art—dating back to ancient China. Professor Snyder points out that the technique of bonsai culture originated in China. Bonsai refers to tray culture of woody plants and utilizes substrate management, root and shoot pruning, shaping of trunks and branches with wires and weights, and more, to create a miniature replica of an aged woody plant usually of weather stressed condition. In Japan, bonsai specimens are designed to take various classic forms. Today bonsai are highly formalized. The Japanese, with an innate love of nature and natural settings, have evolved the technique of landscape gardening in a tray.





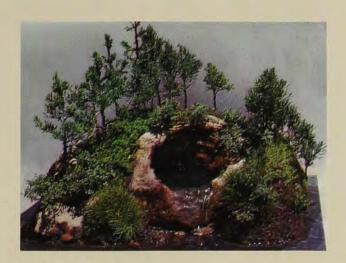
They call it "saikei." Both saikei and bonsai tend to be too structured and controlled for the miniature landscapes designed by Professor Snyder who feels that microenvironments have greater freedom of expression because they deal with an entire landscape and are unhampered by the rigid traditions of bonsai culture. In addition, bonsai plants take many years to develop properly, but even a beginning student can produce a geologically accurate, artistically pleasing, microenvironment in a semester's time.

Trees recommended for the miniature habitats are slow growing sorts with tiny leaves. Various junipers, some cotoneasters, box, the cryptomerias, larches, and cypresses are suitable. Woody herbs such as rosemary and tarragon have their place in these plantings. Among ground cover plants various minute sedums, baby's tears, tiny grasses, mosses, and sedges of restricted stature may be used for understory plants or to emulate grass in the small-scale environments. Professor Snyder substitutes small-leaved cotoneasters for oak trees, small-leaved English ivy for maple trees, myrtle takes the place of birch, and Monteray cypress substitutes for spruce or pine.

Water

Water often is suggested in the microenvironment by the use of sand and gravel. As the microenvironment designer becomes more experienced he can provide for running water in the landscape. Water courses are mudded in, then sealed with a mixture of one part epoxy cement in twelve parts of sand. Rocks, plastic tubing, and electric water pumps complete the water cycle. Professor Snyder's microenvironments that include moving water usually are mounted over a stand which incorporates a tank. The pump is located in the water-filled tank. Water circulates through tubing into the upper parts of the miniature





landscape, emerging under water worn rocks to meander or cascade downward. Eventually the water drains through controlled but hidden escape tubes back into the tank.

The Art of Construction

Once a microlandscape designer has accumulated his raw materials and has a picture in mind it is time to begin experimenting. If you are new at the game, run through Professor Snyder's basic learning techniques.

On a heavy, flat, rectangular piece of slate or marine plywood position a rock so the best features are accented. Most rocks have a front and a back; study your specimen from all angles. Next, get the feel of the rock—remember, at this point it is the underpinnings of a mountain and you are an ant looking at it. Let your rock suggest how the earth (held with mud) should be contoured over it. For example, if the rock has a definite ridge or ledge, a continuation in the earth form would be suitable. Part of the rock might hint at being concealed, another portion may demand exposure. Although it seems strange at first, the interaction between these design elements and you, the artist, becomes very real and valid in the creation of microenvironments. When your rock is clothed with soil you may experiment further with woody plants and ground covers.

The next project omits rocks. On a piece of slate or plywood place five balls of earth ranging in size from golf ball to grapefruit. Position the largest first and follow in order of size. Continue changing the positions of your earth masses until they are in a harmonious and balanced setting. Now shape them into land forms. For example, they might suggest mountain peaks in the distance, or gently rolling hills on the prairie. The addition of three to seven very small plants with moss completes the composition.

Here's a timely aside; gather wild mosses—keep each sort separate—when they are in the sporulating stage, that is, when the small, wire-like stem supporting a capsule is present. Dry the moss clumps; grind them to powder by rubbing through a fine sieve. Mix the moss powder with water and brush it on your raw earth. Under proper conditions of humidity and diffuse light moss will appear rapidly because viable spores from your powder germinate quickly.

Back to developing your landscape. Matching a tree to a rock helps you visualize the erosive forces of nature, in this case, wind. You will come to recognize the relationship between craggy tree and supporting rock.

Sooner or later, as you plan to go beyond experimenting and reach the point of building a more or less permanent landscape, a container has to be considered. You can use a ceramic bonsai tray, size and shape depending on that of your proposed landscape, and that, in turn, is governed by your rocks and plants.



You will have to manipulate the form of your woody plants. If you grow your own "forest" from seeds or cuttings freely prune and pinch plants as they develop. Purchased ones will demand more harsh topwork and will take more time to come back to a suitable appearance. Use copper wire to shape and further form the branches to correspond to contours of rocks and earth. Plant trees close to rocks. For example, a jutting rock may have caused the center branches of a juniper tree to grow upwards and to hang over the flat surface of the rock. This is a point where field observation is invaluable. Visit the land-scape you plan to emulate and study trees and rocks; observe how one affects the other.

Where do you get ideas for your miniature landscapes? They can come from your memory of a scene or of a picture. Remember that your design is an artistic expression, not a carbon copy. Abstract the characteristics of the landscape you wish to reproduce, and capture the essence in miniature.

There is another way to develop a basic design for a particularly handsome rock. Walk around that rock. Imagine yourself reduced proportionately to the proposed scene and get the feel of the mass and form of the now huge boulder. Is it a nice flat rock to sit on and watch a stream slide by? Should there be a bed of woodsy grasses growing under the shade of the greatly restricted Chinese evergreen? Whatever the proposed landscape, there always should be one focal point. Make it an exposed portion of the rock or an important plant. The rest of the environment, consisting of subsidiary plants, rocks, and ground covers will complement and enhance the total picture.

Professor Snyder teaches his students to design microenvironments with as much richness, beauty, unity, and harmony as possible, yet at the same time the finished landscape should be empty enough for the observer's mind to wander and to relate. For this reason the Snyder microenvironments are unlabeled.

Maintenance

Maintenance of miniature landscape depends largely on green materials used in the composition. If native plant materials have been selected the environment in or around the home should be similar. Knowing where the plants originated gives a clue to cultural methods. For example, tropical understory plants need filtered light and humid but fresh air. Plants collected or purchased that normally live on an exposed bluff or mountain need good air circulation and strong light, often an abundance of ultra-violet light.

Maintenance, in general, is focused on keeping trees healthy but in their dwarfed condition. There are several contributing factors. Always plant in or on restricted soil masses. Water sufficiently but with an eye toward limiting available water, and fertilize rarely if at all. Provide for ample fresh air circulation around and through your design but protect it from desiccating breezes. Provide ample light for sturdy, dense plant growth. Finally, prune and pinch frequently; your small plants will grow almost continuously and your job is to add several years to each month's growth.

City dwellers and country people alike can enjoy a total landscape when microenvironments live in their homes. These miniature entities of native scenery are particularly rewarding to people in the concrete canyons of large cities. Sit by one and lose yourself in it; wander through the glades or scale the craggy cliffs. To meet one of these tiny landscapes face to face is a jolt; to be left alone with it leads to an experience that has to be encountered to be understood.

What will Professor Snyder's work come to aside from an interest in these incredible table-sized landscapes? He now is directing his efforts toward human scale wilderness landscapes in urban settings, applying the principals and knowledge gained from working with the microenvironments. These manipulations, micro- or macro-, lead to a greater understanding of natural ecosystems. They help civilization-oriented people relate to nature. They help us to see our position in the overall scheme of nature.



Have Fun With HerbS

To be able to grow the herbs, cut them when fresh, and use them for seasoning, is an experience everyone should have. Once having used herbs, without them that same food tastes flat and uninteresting. Caution must be taken in use of herbs for if too much is used, it is far worse than none at all. They should be used sparingly, sprinkled on as salt or pepper, just before serving, or cooked in the pan with the vegetables or meats for the last few minutes of the cooking period.

Before the days of ice boxes, meats were wiped with herbs to help keep the meat fresh and possibly to cover up taint. Herbs were used for flavorings and seasonings, to take the place of vegetables which were not a part of the bill of fare a few hundred years ago.

When you use herbs you are getting your vitamins in their natural form, and in the way in which they can easily be assimilated by the human body; not in synthetic doses as when taken in pill form. Parsley, for instance, has more vitamin A than cod liver oil, and more vitamin C than orange juice. During the first world war the children of England were given parsley tea to take the place of orange juice which was unobtainable. We have been accustomed to using parsley in this country merely as a garnish. Try using it with salt and pepper just as you do with radishes.

Mrs. Albert D. Farwell*

Herbs might be classified under three headings: medicinal, fragrant and culinary. It is with the latter that this article deals, how to grow and how to use them.

Design of the Herb Garden

Every herb garden should have a definite design of some kind. It has been said a garden should look as well in the winter as it does in the summer. The theory of this being that if there is a good design the garden will always look well with or without plants. A wall, a hedge, or a fence for a background makes a good starter for a design. The design at the beginning of this article was taken from the Blair Kitchen Herb Garden in Williamsburg, Virginia. It was drawn by the

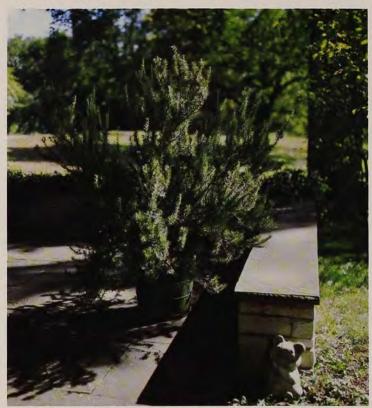


Garlic chives, Allium tuberosum.

late Mr. Milo Winter. A diamond is set in a rectangle encircled by paths. It is an interesting study of a well drawn design; no matter where you stand in this little garden, the lines are always good.

This diamond design can be applied to any size garden, using the diamond in the right proportion to the size of the bed. Refer to Sir Frank Crysp's book *Mediaeval Gardens* for designs of old gardens. Draw some designs for yourself during the winter months. It is a fascinating study and when you have drawn your own motif in the earth later, it is indeed a thrill.

Little dish gardens of herbs can be created in designs which are truly lovely. Fill a low dish with sand, moisten the sand, and place cuttings of *Teucreum chamaedrys*, gray santolina, box, or evergreens, just to mention a few. The cuttings



Rosemary, Rosmarinus officinalis.

will root and the little dish garden will keep fresh for many weeks in the house. Water with a spray. Later these cuttings can be potted up and make new plants.

The accompanying plan is very simple for a border planting of the culinary herbs. Place the high plants at the back if you are working against a background of a hedge or a fence, and if your bed is not a border but has paths all around it, place the high plants, lovage, French sorrel, and so on, in the center and the lower herbs in the front as shown on the plan.

How to Grow Herbs

Herbs should be grown in full sun and in a well drained soil. The earth should be friable, that is, able to be crumbled into small pieces when held in the hand. Little or no fertilizer is needed, as that has a tendency to make the plants large and luxuriant in appearance, but lacking in the volatile oils which are so necessary for the flavoring and fragrance of the leaves. Only one or two of each variety is needed in order to have sufficient flavoring for the small family. The fresh herbs

	· · · · · · · · · · · · · · · · · · ·	ER. PLANTING of C	
3 France	ch Sorrel (A)	Lorage (P.)	French Sorrel (P)
24	h Sorrel (e) O Tarragon ((P) B Tarro	French Sorrel (P)
. S4	mmer Savory (a)	Sweet Basil (a)	Summer Savory (a)
20	Ø 8	Sage (P)	8 4
		Q	
3 2	weet Marjoram	chorvil Chorvil	Sweet Marjoram
2	8 8 8	8 & 8 & \$	& B N

are always the best to use, but the dried ones are very satisfactory. To dry herbs, cut in midsummer just before the plants come into flower. Tie in bunches and hang in a dark, dry, airy place. At the end of two or three weeks, crumble, put through a sieve and bottle for use. Herbs probably are the easiest of all plants to grow. They are seldom attacked by pests, will stand drought; many will survive zero temperatures, and many can be taken indoors as house plants.

Plant your culinary herb garden as near the kitchen door as possible, so as to have your plants handy to take a snip of this or that for flavoring. If you do not have space for a garden, try growing the herbs in pots or boxes.

You will have to buy plants of tarragon as it does not set seed. If you are beginning a herb garden I would suggest that you buy all the perennial plants for a starter. The annuals: chervil, marjoram, sweet basil and summer savory, come up readily from seed.

See the following chart for uses of some of the herbs:

Chives (Allium schoenoprasum) perennial, no salad complete without this.

Chervil (Anthriscus cerefolium) annual, use in salads, soups, omelettes.

French Sorrel (Rumex acetosa) perennial, use the young leaves in salads, and for sorrel soup.

Garlic chives, (Allium tuberosum) perennial, has delicate flavor of garlic, use in salads.

Parsley (Petroselinum hortense) biennial, use as a food, not just as a garnish, sprinkle with onion salt.

Summer Savory (Satureja hortensis) annual, use in salads, a must for string beans.



Sweet basil, Ocimum basilicum.

Sweet Marjoram (Majorana hortensis) annual, used as a seasoning in creamed soups, meat and salads.

Sweet Basil (Ocimum basilicum) annual, use to season any tomato combination and any fish.

Thyme (*Thymus vulgaris*) perennial, for use in salads, soups, creamed soups and flavorings of all kinds.

Tarragon, French (Artemisia dracunculus) perennial, use in salads, meats, soups, vinegar. Do not cut until plant is well established. French Tarragon plants must be bought because they do not set seed, or cuttings may be taken from root of an old plant.

Rosemary (Rosmarinus officinalis) perennial, but not hardy in North. Use on meat before roasting, flavoring soups. Use leaves in deep fat when frying potatoes.

Lovage (Levisticum officinale) perennial, four feet high, has strong flavor of celery; use in salads, soups, vegetables, wherever a celery flavor is desired.

Be careful how you grow your seed. Plant to a depth of at least twice the diameter of the seed. Pour some of the seed from the packet into your left hand, and with your right hand take little pinches of the seed between your fingers and scatter them thinly along a row or over the area where you want your plants. Then press down firmly with the palm of your hand or the back of the hoe. If the seeds are large



Purple basil, Ocimum basilicum 'Purpureum'.



Sweet fennel, Foeniculum vulgare.



Golden sage, Salvia officinalis 'Aurea'.

scatter a bit of earth over them before you press them down. If the soil is very dry sprinkle lightly with a watering can. When they show three or four tiny leaves, thin out to stand six to ten inches apart. Do not start your annual seeds until danger of frost is past.

After you have worked with the culinary herbs you will want to try a few of the fragrant herbs such as the sweet geraniums, heliotrope, lemon-verbena, sweet lavender or mignonette. "The fragrant geraniums are for enchantment only"; reason enough for having them in our gardens!

I hope I have whetted your appetites, stimulated your gastric juices and inspired you to grow your own herbs. You will find that you will be well rewarded. \otimes



THE YELLOW AFRICAN TULIP TREE

Edwin A. Menninger*

Brand new to American horticulture and appearing simultaneously in Florida and Hawaii is a yellow-flowered form of the African tulip tree, *Spathodea campanulata*. This tree is not related to the American tulip tree *Liriodendron tulipifera*.

The familiar form of the African tulip tree, with evergreen foliage and clusters of brilliant red, or red-fringed-yellow, tulip-shaped flowers, is deservedly popular in Florida, Hawaii and other warm areas. Its spectacular flowers appear above the foliage, blooming over a period of several weeks, and repeating the display two or three times a year. The flower buds come in banana-like bunches as big as a turkey egg. The outer buds push forth their flowers first, and as these flash in the breeze a few days and then fall away, they are replaced by other opening buds, a beautiful, continuing process. Each tulip-shaped flower is as big as a man's fist.

Now comes the excitement. After the species had grown in South Florida and Hawaii for more than fifty years, suddenly in both places appeared a tree with magnificient, golden yellow flowers. Nobody in this country had ever seen anything like them. The new tree in Florida was at the U.S.D.A. Plant Introduction Garden in Miami. The other appeared in the MacKenzie Nursery at Kailua-Kona, Hawaii. Both are being propagated by root suckers. This author recently received seed of the Hawaiian tree and also of the biggest yellow-flowered tree

Opposite, African tulip tree, yellow-flowering form.

at the Greensmith Nursery in Nairobi, Kenya, and turned them over to the Fairchild Tropical Garden at Miami to propagate; unfortunately, it is unlikely that more than a few of them will produce yellow flowers, but only time will tell.

Seeds of the yellow-flowered form have been received three times in recent years at the Plant Introduction Station in Miami, and all of these originated at the Peter Greensmith Nursery in Nairobi, Kenya. The first of these was received through this author in December, 1970, and the number M-21575 was assigned to it. Four plants of this in Miami, and one in the parking area at the First National Bank of Stuart, Florida, have reached heights up to eight feet but have not yet bloomed. Another shipment numbered M-21664, was received in April, 1971, from Longwood Gardens, Kennett Square, Pennsylvania. One of these bloomed bright yellow in Miami last year. Shipment M-22185 was received in March, 1973, but none of these has flowered yet.

At the Miami garden, all of these introductions are referred to as the "yellow African tulip", which doubtless will continue to be its name in Florida.

Where and when did the yellow form originate? J. B. Gillett of the East African Herbarium (East African Agriculture and Forestry Research Organization), at Nairobi, Kenya, writes in this connection:

"The only definite published statement which I know of concerning the yellow flowered form is in Eggeling & Dale: *Indigenous Trees of Uganda* ed. 2 (1952) p. 42 "A form with rich buttercup yellow flowers, well worth perpetuating, occurs in Bugishu and a somewhat similar tree has been found in Mengo." No such remark is in the first edition of this work (1940) so one may perhaps conclude that the yellow form was found after 1939 and certainly before 1952."

"Leading amateur gardeners in Kenya like H. M. Gardner who was for long chief conservator of forests in Kenya has told me that the yellow form occasionally cultivated in Kenya is derived from the Uganda plant. He also told me that what he thought was the sole known wild tree had disappeared. The yellow form is simply called that with no special name."

"Mr. Gardner (very vigorous at 83) tells me that a farmer called Arthur Barnley, farming in the Cherangani hills, N.W. Kenya, found the tree in Uganda about twenty-five years ago and obtained a root sucker from which he established a tree in his garden from which in turn a few people in Kenya have obtained suckers. Mr. Gardner does not know of anyone trying to grow it from seed."

This is the same Mr. Barnley who is quoted in the 1962 edition of *Flowering Trees of the World* as follows:

"Tulip trees with pure yellow flowers are extremely rare. Arthur W. Barnley, P. O. Box 332, Kitale, Kenya Colony, sent the author a kodachrome slide (Plate 39) of the yellow form with this note: "I took many photographs before I got the color right. I have distributed seed of this form but have not yet heard of anyone's success with it. The only sure way of propagation as regards accurate yellow color is by root cuttings."

Peter Greensmith, commercial nurseryman of Nairobi, Kenya, writes of early acquaintance with the yellow form:

"Sometime around fifteen years ago an old friend of mine saw a

yellow flowered *Spathodea* in a semi-forest area of Uganda, near Kampala, and dug up three plants from beneath the tree; these may well have been root suckers. These three trees were grown on my friend's farm on the Cherangani Mountains in Western Kenya and my original tree was a root sucker. However, as soon as my tree and those of other friends seeded we started growing them from seed and I have sent the seed to contacts of mine all over the world."

The origin of the yellow form in Hawaii is told by Mrs. Barbara MacKenzie of the MacKenzie Nursery, as follows:

"A friend of ours, L. W. Bryan, retired forester, had a friend, Dave Barry, Jr., who brought back some yellow African tulip tree seeds from Greensmith's nursery in Nairobi, Kenya, in September, 1970. Five of the seeds germinated and he brought them to us to plant and grow. Of the five, four came out red and one came out this beautiful golden color.

""Before we transplanted the tree out of the ten gallon container, two roots had gotten out and were shooting up young plants. We have been taking slips off of these and starting new plants from them in our mist room."

Our tree is becoming known here as Bryan's Kona Gold.

Some variations in the yellow color are noted by these authorities. Mrs. MacKenzie writes:

"In our nursery the color is a beautiful warm gold. I am enclosing a slide of it but the color is not exactly accurate. The closest way I can describe the color is to say that it is exactly like the color picture of the Zantedeschia elliottiana, page 139 in our Exotica 3."

Dr. Russell Seibert, director of Longwood Gardens, Kennett Square, Pennsylvania, writes of his part in the drama:

"Yes, I had a bit to do with stimulating the introduction of the yellow *Spathodea* into the U.S.A. In 1963 I visited Peter Greensmith and asked specifically that seed of this be sent to us when available. As a result our introduction card indicates:

70974-Spathodea nilotica Coll. August, 1970, from a yellow flowering tree. Rec'd as seed 9-16-70 from Mr. Peter Greensmith. Horticultural Consultant, Langata, 586, P.O. Box 604, Nairobi, Kenya. Later, plants were distributed: as plants—I sent to USDA Introduction Garden; and later three more sent to above. As plants three sent to Fairchild Tropical Garden. As seedlings also sent to Parrot Jungle, La. Tech. Univ., Marnier Lapostoll, France, Fantastic Gardens, Calif., Jungle Gardens, Foster Gardens, Honolulu, Hort. Bot. Bogor, Indonesia.

We still have one plant here which so far has not flowered. This is not unusual as only on one occasion have we ever had a *Spathodea* put out a bloom under glass, and it was a poor representation of the genus.

Seedlings were also sent to Miami and also distributed on our surplus plant list which would account for Dave Barry having it."

David Barry, Jr. writes that he has never seen the yellow Spathodea in bloom.

His letter continues:

"When Peter Greensmith sent me seeds I turned them over to my good friend, Col. L. W. Bryan, of Kona, who gave them to MacKenzie to grow. At the time of sending the seeds Greensmith said that the seeds of this species can not be depended on to produce yellow flowers.

I have a single plant in my nursery that I plan to send to Honolulu later this year to be planted near my home. I believe it was sent to us by Longwood Gardens."

Because both the Hawaiian and the Florida trees were received as seed of *Spathodea nilotica*, it is important to emphasize here that this name is synonymous with the commoner name *S. campanulata*, and it is not a new or different species. Confusion has long existed over the names. Noel Y. Sandwith of the herbarium at Kew, long outstanding authority on the Bignoniaceae, wrote this author twenty years ago that he regarded the two names as synonyms.

Al Gentry, assistant curator of the Missouri Botanical Garden at St. Louis, now recognized as a leading authority on this family writes:

"I agree with Sandwith that they should be regarded as synonyms. Even were they not to be considered synonymous, the yellow-flowered form could hardly be identified with *S. nilotica* any more than with *S. campanulata*."

Writing of how a yellow form might originate, Mr. Gentry speculates:

"I had never heard of a yellow-flowered form of *S. campanulata*. Although I cannot say for sure, having never seen a specimen of this plant, I am reasonably certain that it is only a cultivar. I have seen it pure red (that is, without the yellow border). Although, I have not looked at the full pigmentation of the plant, I would guess that its normal red-orange flower color is due to two separate pigments, one yellow, the other red. Presumably a single gene mutation would be all that would be needed to prevent formation of the normal red pigment and this would result in a pure yellow flower. It seems probable that this is the explanation of the yellow-flowered form which should then be treated as a cultivar. Of course, it is quite possible that such a mutation could have occurred independently in a number of instances."

"As to the prevalance of the yellow-flowered form, it would seem to me unlikely that it is known outside of cultivation. There are quite a number of Bignoniaceae with two color forms known from nature, but most of these are typically lavendar-flowered type with an occasional white-flowered individual. I suspect that in red-flowered species like *S. campanulata* (i. e., bird pollinated) a yellow-flowered form would be at quite a selective disadvantage, although such allegations are very difficult to prove."

Mr. Gillett of the East African Herbarium writes:

"We now incline to the view that *Spathodea nilotica* is not specifically different from *S. campanulata* though I am not aware that anyone has studied the question really thoroughly."

Mr. Greensmith writes on this subject:

"I think that you are correct in stating that Spathodea nilotica is synonymous with Spathodea campanulata."



Constance Davidson ...a gardener's gardener

Elinor Clarke*

There seems to be at least one essential difference between American and European amateur gardeners. We tend to talk at length about gardening, plants, and flower arranging; they talk only when it leads to more actual gardening, instead, they dig in and become unbelievably expert on a plant, a group of plants, or on gardening in general. Our A. H. S. editor and I were discussing how to call this difference to the attention of our American gardening friends in hopes of stimulating a more mature attitude in American amateur gardening. After much thought, I concluded that a good way would be to point out, step by step, the development of an important European gardener—indeed, a world gardener—because my late friend, Constance Davidson, was respected in gardening circles right round the globe. Here is her story; read it and recognize her greatness. More important, believe that you and I, each of us, can with our love of plants and gardening make just such contributions.

Constance Davidson's devotion to gardening developed after her family was raised. She was born, Constance Ellen Cameron, on February 14th, 1901, in Calcutta, India, where her father was manager of the Hong Kong and Shanghai Bank. After a few years the family returned to Scotland. Her childhood was spent in Edinburgh during the winter months and in the West Highlands during the summer. Her later education was at Harrogate College where

she did well and expressed an interest in Botany, but was discouraged from pursuing the course. After school she lived in Edinburgh and Ardgour, enjoying a busy social life and travelling with her mother to the United States and Canada.

Constance married Dr. James Davidson, pathologist and bacteriologist, in 1927. In 1935 Dr. Davidson was appointed Director of the London Metropolitan Police Laboratory and the family moved to

Hendon in northwest London. Soon the war years loomed. The two Davidson daughters were sent to school in Scotland and both Dr. and Mrs. Davidson were busy in war work. Though there was a small surburban garden at the Hendon house, Dr. Davidson usually was gardener.

Then came the "Dig for Victory" program and part of the lawn was converted to a vegetable garden. Toward the end of the war Constance became bored with vegetable growing and part of the vegetable patch became the site of a rock garden. Under protest, the school girls accompanied their parents on trips to Wisley and to Kew as well as to alpine plant nurseries. Parcels of plants arrived and the rock garden soon became established.

Tired of London after the war years, Dr. Davidson accepted a post as Senior Lecturer at Edinburgh University in 1946 and the family returned joyfully to Scotland. No suitable house could be found in Edinburgh—the Davidsons almost stifled in a town apartment—but in 1949 the right house was found in the neighborhood of West Linton. I am indebted to the Davidson's daughter, Mrs. Patricia Davidson Thorman, for the above information.

West Linton, a Peeblesshire village, lies at the foot of the Pentland hills fourteen miles southwest of Edinburgh. The population, including the outlying area, does not exceed 2,000. The highest elevation is about 1020 feet above sea level. Some parts of the village date back three centuries. The neighborhood is favored for summer vacationing, with houses being rented for the season. The majority of the residents commute by auto to jobs in Edinburgh unless they are retired.

The latitude of West Linton is about even with the midpoint of Hudson's Bay. Around the summer solstice it still is light enough to play golf at 10:00 p.m. and gardeners have been known to weed the vegetables as late as 11:30 p.m. But only July and August are reliably free of frost. On a recent June night the

temperature dropped to 18° F., turning gardens into shambles just before the Edinburgh rock garden show. As though early and late frosts were not enough, mid-winter gales take a fearful toll. During one January storm thousands of trees were mowed down as if a gigantic machine had rolled the countryside flat. During that storm West Linton was cut off completely for over a week with power and telephone lines down.

To this inhospitable environment came the Davidsons, intent on furthering their interest in growing su-



perb rock garden plants. Their home, Linton Muir, was to become a mecca for rock gardeners from all over the world.

The Davidsons soon became active in local horticultural affairs. Already they were members of the Alpine Garden Society, and were becoming known for their mountain climbing in the Alps, the Pyrenees, and on Crete. Of the eighteen members of the Scottish Rock Garden Club in the area, fourteen were from West Linton. Soon Dr. and Mrs. Davidson were leading lights in this talented group.

Constance Davidson assumed the

The Main Street of West Linton, Scotland.

Editor's note: The Constance Davidson syndrome is catching. It was noticeable among rock garden enthusiasts during the 1972 A.H.S. Congress in Seattle. My thick file of vastly informative, entertaining, and open-hearted letters from Eleanor Clarkeassembled while working up this article-proves that the Bear Swamp Gardens proprietors have caught it. Granted that rock garden and alpine plant people are a special breed with apparently endless dedication to their specialties, any gardener can be hooked on horticulture. It is gratifying to watch the addiction spread.



Early snowdrops in the Davidson garden at Linton Muir.

responsibility for the S.R.G.C. seed exchange in 1955. In any horticultural group this is one of the most arduous tasks, requiring the utmost dedication to detail. Not satisfied just to get the seeds into the mail, Constance made frequent trips to the Royal Botanic Gardens in Edinburgh to check the accuracy of the names of donated seeds. Mrs. Winifred Corsar, a childhood friend of Constance living some eight miles away, became a close collaborator with the Seed Exchange, helping once or twice each week throughout the winter months. She recalls that practically all of Constance Davidson's social life, even her dining room and other space, was given over to the exchange. Mrs. Corsar soon noted Mrs. Davidson's splendid capacity as an organizer and recognized the vast knowledge she had of her subject. She recalls the enormous fun they shared during the Seed Exchange work sessions.

The disrupted dining room was not to be restored to normalcy when Constance Davidson traded the Seed Exchange for the S.R.G.C. Slide Library. In 1956 Dr. Davidson, the family photographer, had begun to assemble a slide collection of rock garden subjects, including spare slides contributed by members. Originally envisioned as a source of slides for members who were called on to give rock garden talks, the project grew into a more ambitious undertaking, with lectures to be provided with the slides.

The Davidsons took the development of an illustrated tape lecture project in stride. By 1972 Constance handed on to the present Curator of the program six lectures on tape and nearly 3,000 slides in excellent condition and well organized. When the question arose of making some of the slide-lectures available to gardeners in the United States and in Canada Mrs. Davidson responded "We members at home have often regreted that overseas members get so little use of the services offered by the Club. I am more than willing to help." Following a complicated exchange of letters, details were worked out to her satisfaction and slides and tapes were dispatched to the United States. But she was looking out for other parts of the world as well. "I had a request from an Australian member for eighty slides to be sent surface mail." In her next letter I find she wrote "A box of 100 slides has just been sent to Australia-with a prayer for their safe arrival. They are to circulate there all summer." Again, "Another interesting letter has come from one of those poor Czechs. I do feel sorry for them, they have a miserable life. He directs a Botanic Garden. I had to answer this letter in French. It took me a long, long time." Constance Davidson had a worldwide influence on rock gardening.

But what about the Davidson garden? Though buried with com-

mittee work, the Davidson garden developed beautifully. It was a garden to be proud of, open to all visiting groups, both local and from overseas. "There is no one to look after the alpine house or garden, which we do ourselves," Mrs. Davidson wrote. "It isn't easy to find experienced gardeners to take charge of young plants in one's absence."

It would be impossible to say which counted more with Constance Davidson, plants or people. Possibly with her they were almost synonymous. "A member phoned recently to ask if I could supply a ciné film of gardens in the United States. Of course, I could not. I think there is much interest in American and other gardens. How about doing a tape of your own and/or any other gardens? That would be splendid." Wrote Mrs. Davidson to a stateside correspondent. Though she operated on a worldwide base, Constance Davidson never forgot her neighbors. Soon after moving into Linton Muir she organized the annual village flowering bulb show, and inevitably produced some very fine pots of flowers. She would distribute hyacinth and daffodil bulbs to the village children to encourage them to take an interest and grow them for exhibiting at the show.

She also exhibited pots of alpines throughout spring and summer. As the plants were always well grown and often unique, the Davidsons usually returned home with exhibitors awards. Mrs. Thorman writes of her parents "There was much travelling round Scotland to the various shows, the little van crammed with pots of alpines. But at no time could she (Constance Davidson) be considered a 'pot hunter,' a type she abhorred. She exhibited only to swell the numbers of exhibits and to encourage interest in showing by other alpine garden enthusiasts."

Shortly before her death due to cancer on January 1st, 1973, Mrs. Davidson was elected a vice-president of the S.R.G.C. in recognition of her great accomplishments.

I hope through this brief biography I have given you a true glimpse of my great gardening friend, Mrs. Constance Davidson. Her gardening spirit was indomitable; gentle, but infectuous. Her attitude always implied "if I can do it, you can, too." Her milieu was her garden—but she was happiest when she was sharing its joys with a crowd of people. She took up gardening after her family was raised and elevated herself to international stature in the gardening world. The Constance Davidson approach of learning all there is to know of a subject characterizes the European gardening attitude. She worked in depth, studying, gathering, and enjoying plants to the utmost. She believed in ever improved communication. As she pointed out, modern techniques of electronics and photography have provided gardeners with more of an opportunity to get together than ever before. We gardeners need to dedicate ourselves to Constance Davidson's ideas. We need to work to know our plants. We need to share our knowledge and our enthusiasm. We need to do our share in reintroducing people to the great and exciting world of horticulture. @

that The shiles wary very much in greating. Coming as They do from a chile Lobron, inc we good, others not so good - so plane don't expect to much of Them. A ym feet disposed to him out The est to gloups or members of The S.F. G.C., it would he very vice, and To could have a writer put in The Trunial to that effect, but remember Then ill be you property, and you need not feel obliged to do co. When he could not take Ectures, or just cets of elides, I etipulate That They are returned the day ofter The lettere " provided in The same wropping as received. I still that most of The numbers are very good about This - but more of This if, and when you diade to have Them. he buy with you thou Festival - what an modutak nig!
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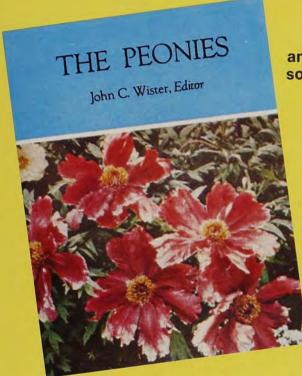
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