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The National Horticultural Magazine

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Iris Hybridizing

Agnes Whiting

We began planting iris seed in 1935 just for fun. We had about two hundred of the better iris varieties in our garden, all carefully labeled. We belonged to the American Iris Society and other members came to see our plantings. We had made several trips to the Sass Gardens where the seedlings interested us still more than the named varieties. Having learned about pollination at the Sass's, we made a few crosses and got a nice crop of seed. When our first seedlings bloomed, we were disappointed as they were no better than their parents. It was not as easy as it looked. We bought two hundred more of the newest and best irises, including many Sass varieties and seedlings. During the winters we studied the parentage records of every variety we grew and read everything we could find on hybridizing and genealogy. We learned that good seedlings came from irises that not only looked good but also had good family records. Good breeding is important in iris. We chose for parents those irises whose good qualities are family traits. We planned our crosses carefully to combine many inherent outstanding characteristics. We soon noticed a steady improvement in the seedlings. By continued study and the use of the best iris from about forty other breeders with our own seedlings as they became worthy, we have constantly raised the standard of quality.

We have never limited ourselves to any one system, such as line or cross breeding, in our hybridizing. We were not out to prove any theories, we just wanted results. We often used our own seedlings crossed with good named varieties, as this gave us combinations not used by other breeders and thus more chance of something new and different. We found the Sass irises the most useful parents and used so many of them that Whiting irises have a definite Sass flavor. Not only are Sass irises superior to many others in color, size, form and substance, they are perfectly hardy, with excellent growing habits for cold climates. Later we realized the need of producing strains that would grow and bloom equally well in cold and warm climates, so we combined the hardy strains with the more tender ones so much used in California. A "hardy" iris is one that takes a natural rest or dormant period of growth. As this period comes about four months after blooming time and lasts nearly six months, it makes them well adapted to cold winter climates. A "tender" iris usually keeps on growing nearly all year, in warm climates. In cold climates it stops growth in winter, but

Garden Glory
Blue Rhythm

The Society wishes to express its gratitude to Mrs. Charles G. Whiting, Maple Valley Iris Gardens, Mapleton, Iowa, for the loan of the electrotypes that produced these color illustrations, and to Mr. William H. Guenther, Artcrafts Engraving Company, Saint Joseph, Missouri, for his excellent manufacture of the electrotypes and caring for the details of reproducing the illustrations for the Society. Ed.

starts again during any warm spell. This fresh growth cannot stand the change back to freezing weather so the plant winter kills, or at least loses its bloom points. A good iris which grows and blooms equally well in cold and warm climates is bound to gain world wide popularity. This goal has not yet been attained in all colors. The deep reds, which are very hardy in cold climates, tend to bloom themselves to death in a warm climate with all year growth. So there is much still to be accomplished.

'Blue Rhythm' is an all climate iris. We believe that this quality was mainly responsible for its widespread recognition. After winning an Honorable Mention and an Award of Merit in the American Iris Society, it was chosen for the Dykes Medal in 1950. That same year it was given the President's Cup as the best iris seen at the Annual Meeting of the A.I.S., and was also given an Award of Merit by the Royal Horticultural Society and the Iris Society of England, jointly, at the Wisley Trials. In 1953 it was given the additional award of First Class Certificate by R.H.S. and I.S of England.

'Blue Rhythm' comes from four blue irises each produced by a different hybridizer. 'Blue Triumph' (Grinter), 'Aline' (Stern), 'Sierra Blue' (Essig) and 'Miss Camelia' (H. P. Sass), were chosen by us for use in breeding for better blues. Several others were also used but these produced the best results. Not only were they the best blue irises of their time but their family trees for generations back, showed steady improvement in quality. 'Blue Triumph' × 'Aline' produced many seedlings of pure coloring, the best one of which we named 'Annabel.' Neat form and smoothness of color are its better qualities, close branching and moderately small size its drawbacks. 'Sierra Blue' and 'Miss Camelia' are much larger flowers and all of the seedlings from this cross were large and well branched. Although 'Sierra Blue' is from a mesopotamica strain and consequently somewhat tender, this trait seemed to be recessive when crossed with the perfectly hardy 'Miss Camelia," as all of their seedlings wintered well here. We named the best one 'Blue Zenith.' It is large, tall, well branched and of deep sky-blue coloring, but a white haft and throat detract from its beauty.

Next we crossed 'Annabel' with 'Blue Zenith,' hoping to concentrate their best features in at least part of their offspring. The results were beyond our hopes as every one of their thirty seedlings was an improvement over both parents. All were as large, well branched and sturdy as 'Blue Zenith,' and nearly all of them showed the smoothness of color tone so characteristic of 'Annabel.' We found it difficult to pick the best until the very latest one opened. It surpassed all the others and was named 'Blue Rhythm.' In spite of all of its honors, we do not consider it the ultimate blue iris. We are still working for a purer blue, trying to eliminate the lavender infusion. This will take time but it will come.

Our iris breeding has covered a complete range of colors. There were many fine, large, light yellows in commerce when we began breeding, but most of them were tender. Crosses with hardy varieties, preferably reds or red blends, seemed logical to bring richer colored, hardy yellows. 'Happy Days' × 'Matula' brought us 'Golden Spike,' the deepest-toned yellow of its time. 'Matula' (H. P. Sass) is a red-brown blend that contributed more than any other iris to the breeding of Whiting irises. 'Rocket,' a still deeper orange yellow, came from 'Golden Spike' × ('Sandalwood' × 'Naranja'). 'Golden Hind' × 'Golden Spike' brought 'Cloth

of Gold.' 'Golden Spike' received an A. M. in 1942, 'Rocket' in 1947 and 'Cloth of Gold' in 1950.

The orange tone of 'Rocket' comes from an overlay of red brown on the falls. Hoping to clear this up, we crossed it with 'Ola Kala,' the finest Sass yellow. From this cross we got many clear, deep orange yellows, three of which were named. 'Gold Sovereign,' which received an A. M. in 1953, is the most brilliant one, 'Lodestone' the darkest yellow and 'Good Measure' the largest and perhaps the best.

Most of our iris breeding has been directed toward rich, pure self colors. But the warm and lovely blends that came along could not be ignored. 'Mellowglow,' 'Mirabelle,' 'Lavender and Gold Lace,' 'Arab Chief,' 'Etude' and others were named and found favor as well as awards. Each in turn became the parent of still better irises, both selfs and blends. 'Arabian Nights,' however, came from two of our seedlings which had not been named but whose parentage records included 'Matula,' 'Marisha,' 'Amitola' (Sass blends), 'China Maid' (Milliken) and 'Far West' (Kleinsorge). It is the result of several generations of selective breeding with seedlings derived from the best productions of other hybridizers.

'Three Oaks,' a much warmer, rosier blend, came directly from 'Matula' × 'China Maid.' Although handicapped by poor branching, its rich coloring has made it a favorite and given it an Award of Merit. 'Three Oaks' has become the parent of many still better irises including 'Campfire Glow,' 'Gypsy Rose,' 'Midcontinent,' 'Wood Opal,' 'Araby Rose' and 'Mauve Queen.'

One of our fondest hopes was to produce a good red iris. One of our first tries for this, 'The Red Douglas' (J. Sass) × 'Garden Magic' (Grinter), brought us 'Garden Glory.' It received an Award of Merit in 1947 and many discriminating iris judges still call it the nearest to true red of any iris. Others say its wide popularity is due to its smooth, unlined haft, dark beard and enameled finish. Spectrum red is unknown among iris colors and is perhaps unattainable. Surely it would be too sharp a color to be pleasing among existing iris colors. Still, the cry goes up for a redder iris and who can resist popular demand? 'Garden Glory' × 'Rocket' brought us a brighter red, 'Technicolor,' but it lacks the smooth haft and glossy texture of 'Garden Glory.' 'Technicolor' × 'Lodestone' gave us a still brighter red now named 'Pepperpot.' It is not large but its brilliant color has impressed so many garden visitors that it will be introduced this year as a novelty.

A few years ago there was much talk among hybridizers concerning the difficulty of breeding any improvement into amoenas. This term is used for irises with white standards and colored falls or with very light standards and deeper colored falls. Pink amoenas were considered a real challenge. We crossed 'Wabash,' a white and purple amoena, with 'Fair Elaine,' a white and yellow, hoping to clear the blue from the purple of 'Wabash' and leave pink. All of the seedlings from this cross were dull, muddy, bicolor blends. From these we chose the two least objectionable ones and bred them together to produce second generation seedlings. Some of these were still muddy but a few were clear amoenas or pink and red bicolors of the amoena type. We named the clearest one 'Rumba Rose.'

Although our first efforts toward pink iris were a flat failure, we have never given up the naive belief that it can be done through blends. Choosing pink-toned blends that came through our own crosses between yellows and

rosy reds, and using them with similar blends from other breeders, we began to see results in much pinker blends. By using only large, heavily substanced flowers for parents, the quality of bloom as well as the color progressed. 'Mirabelle' crossed with 'Angelus,' an orchid-toned pink from Mr. Egelberg, gave us our first real break. This cross brought 'Pathfinder,' a very pink blend. It was named 'Pathfinder' because we felt sure that it would lead the way to a real pink iris of full form, heavy substance and pure coloring. Crossed with 'Shannopin' (Pillow), it gave two fine, large pinks of amoena type, 'Maytime' and 'Thistle Bloom,' and a light pink self, 'Opera Pink.' 'Maytime' received an A. M. in 1953.

During these years several breeders, including David Hall, the Sasses, Mr. Lapham, Dr. Loomis and others, were making interesting strides with light orange-toned pinks with tangerine beards, variously called 'shell pink,' 'flamingo pink,' and 'pink bud' irises. The truth is that none of the first ones did look very pink except in bud. Slowly but surely they became better and pinker and fabulously popular. We have crossed some of our own pink blends with Hall's flamingo pinks with most interesting results. 'Tea Rose,' a sister seedling of 'Three Oaks,' crossed with a Hall seedling gave us a most unique and very heavily crimped orange pink iris which we have named 'Crepe Suzette.' 'Pathfinder' crossed with Hall seedlings gave several very heavily substanced light-pink irises. The best one of these we crossed back with 'Pathfinder.' This cross has, at long last, brought several deep-toned true pinks. One of them has been named 'Pink Clover.'

We should be satisfied with the results we have obtained in nearly twenty years of hybridizing. Certainly we have had far more recognition for our work than we ever dreamed of receiving. But with more good irises to work with and the benefit of experience, we shall go on for the sheer joy of seeing what the future has in store for us.

A Virginia Garden In 1774[1]

MARJORIE F. WARNER

Although Fithian's Journal[2] was published quite a number of years ago, and may be known to some of the readers of this magazine for its historic and personal interest, I have never run across any mention of its contributions to the knowledge of gardening in colonial Virginia.

Philip Vickers Fithian was born December 29th, 1747; was a student at Princeton College, 1770-1772; entered the Presbyterian ministry in December, 1774, and was sent out as a missionary to Western Virginia and Pennsylvania, but was appointed a chaplain in the Continental army only a short time before his death, which occurred in October, 1776. During the period of his theological preparation, he spent a year in Virginia as tutor in the household of "Councillor" Robert Carter, at Nomini Hall, Westmoreland County.

Fortunately for us, Fithian was a keen observer and practiced diarist, who did not scorn to write of many trivial matters. His descriptions of the

[1]Reprinted by permission of Norman Taylor from the Journal of the International Garden Club, March 1919.

[2]Philip Vickers Fithian, Journal and Letters, 1767-1774. Edited for the Princeton historical association by John Rogers Williams. Princeton, N. J., The University Library, 1900.

country are often very suggestive, and there is an interesting, if slightly obscure, account of the arrangement of the buildings and grounds at Nomini Hall, which is unfortunately too long for reproduction here. Best of all, he had a delightful habit of walking in the garden, and from very early in the year till past midsummer he gives frequent notes of garden operations, fruits and vegetables grown, field crops, etc. Meager as these comments are in comparison with what we desire to know, they yet afford the best record I have found of gardening in colonial Virginia, and, while the *Journal and Letters* is perhaps chiefly valuable to the student of social life and customs, the importance of the work as a garden document alone is sufficient reward for its publication.

Fithian arrived at Nomini on the 28th of October, 1773, but does not mention the garden until the very last day of the year, when he walked there with Mrs. Carter, questioning her about a row of small slips, and as they walked along "she would move the ground at the Root of some plant; or prop up with small sticks the bended scions," and, after taking two turns throughout the entire garden, they went out into the Area to see the "Plumb-Trees." At this time he mentions the two Negroes who, he explicitly states, were "Gardiners by Trade," who were constantly employed in the garden whenever the weather permitted, but on February 24th he notes the arrival of Mr. Gregory, the "Colonel's Gardiner," very likely brought over from England or Scotland, who began to work with the men who had been in the garden all winter, and under date of March 7th he says that Mr. Gregory's wages are a half crown daily through the summer.

The spring gardening operations may well have begun on the 8th of February, when Mrs. Carter ordered the sowing of lettuce and peas. On February 21st he says: "They are beginning to work in the Garden with vigor," and on the 24th he notes the planting of the common garden peas. On March 16th he walks in the garden with Mrs. Carter, and remarks: "It is beautiful, & I think uncommon to see at this Season peas all up two & three Inches — We gathered two or three Cowslips in full-Bloom; & as many violets—The English Honey-Suckle is all out in green & tender Leaves—Mr. Gregory is grafting some figs—Mrs. Carter shewed me her Apricot-Grafts; Asparagus Beds &c." On March 21st he writes: "The peas have grown admirably since my last Walk; & indeed all the Herbs seem sprouting."

The first of April he noticed people plowing their land for planting corn and tobacco, and even in one field saw women planting corn, though he remarks that it must be early, even for that locality. Under the same date he says that people hereabouts raise no flax, their land generally being too poor for the purpose, and continues that their method of farming is slovenly and wasteful, planting large quantities of land without manuring, working it very hard to make the best of the crop, and after cropping one piece of land removing the fences to another, leaving the first as a "common to be destroyed by Winter & Beasts till they stand in need of it again to plough." The soil is usually light and sandy, producing in great quantities "shrubby Savins & Pines, unless in the Vallies, (for it is very hilly) & near the Potowmack where it is often vastly rich." On the 7th of April he observes: "In every field we saw Negroes planting Corn, or plowing, or hoeing," and on the 10th, in various parts of the Carter plantation the Negroes were digging up the

small plots allowed them by the master for planting their own peas, potatoes, etc. Harvesting began the latter part of June; on the 25th he is informed that people are reaping "not only Rye but Wheat in the Neighbourhood; certainly it is earlier than we reap to the Northward." July 4th was the "Height of Harvest," while the 7th, Colonel Carter speaks of having his own rye mown down. On July 14th Fithian "was not a little Surprised to see Corn out in Tassel," on the 19th he reports it as pretty generally beginning to tassel; and on the 21st he saw many of the hills in silk. On August 2d, at Mount Airy, the nearby estate of Colonel John Tayloe, he saw corn rank and set thick with ears, "three commonly on a Stalk," and on August 13th he mentions "Roasting-Ears." Near Colonel Tayloe's he also noted the only flax he had seen in the colony (although he was told that they raised much of it in the upper counties), about an acre and a half, which they were just pulling on the 2d of August, "exceedingly out of Season."

From time to time Fithian notes the fruits and vegetables in season. On May 25th, on his return from a visit to New Jersey, he had for supper "an elegant dish of Strawberries & cream," and the following day he says that they now have "great plenty of Strawberries, some Cheries, Gooseberries &c." On June 10th he went with Ben Carter "over to Mr. Turberville's to gather Cheries, which are there in great plenty." July 2d he sups on "Artichoks, & Huckleberries & Milk;" July 4th he mentions ripe mulberries, and on the 6th he writes that they have "every Day good Fruit for Dinner, caudled Apples, Hurtle-Berries with milk &c." The huckleberries, however, were probably not from the garden, but growing wild in the neighborhood. July 28th, figs were just beginning to ripen in the garden, and lasted for some time, as on the 26th of August he gathered figs, but remarks that while the ladies seem fond of them, he himself "cannot endure them." The early part of August must have been the height of the watermelon season, and the Virginia Negro, then as now, an expert in melons, for we find "Dadda Gumby," an old slave to whom Fithian had shown kindness, offering him melons from his own garden. Once Fanny Carter, one of the little girls, presents the tutor with a half watermelon, and when she was ill, on August 15th, he records making her a gift of a large muskmelon.

Other natural products besides figs were evidently new to Fithian. One suspects that his introduction to the persimmon occurred on March 6th when he "gathered and eat some Pisimmonds from a large Tree which were exceeding sweet, & agreeable," and on September 23d he saw "Barberry's, Sloe's, & Pomegranates, neitheir of which I had seen before." Few allusions to flowers occur; under date of June 23d, he was "diverted tho it was a little cruel, to see the Girls gather the Blossoms of some Prickly-Pears," probably growing wild; and once, on the 23d of July, he says that Priscilla and Fanny each presented him with a "Jesamine Nose-Gay."

On May 4th-6th, while away on a brief visit to New Jersey, Fithian noted a severe freeze, the effects of which were also felt at Nomini,[3] for on June 4th he says: "The Frost of the fourth of May has been much

[3]Letters to the Reverend Andrew Hunter and John Peck, under date of June 3d, 1774. In the former Fithian writes: "The expected produce of Gardens and Peaches (which were some planters chief dependence) are not only almost wholly destroy'd, but in ye upper parts of the province Wheat and Rye are so much cut off that the owners think it best to mow it down for fodder."

more severe and fatal here than in the northern colonies—The Peaches here, except for Farms lying near the Potowmack are wholly destroy'd . . . And in these lower Counties in many places the Woods appear like November, & the Leaves are actually dropping!" He does not write further about the peach crop, though he states on September 22d that "Peaches & Fruit are omitted at Dinners," implying that they had been constantly served up to that time, and on August 22d he rode to Squire Lee's (Richard Lee, of Lee Hall, Westmoreland county), who took the party into his garden, which was large and had an abundance of fruit, and gave them fine peaches, nectarines, etc., and again on August 25th, at another neighbor's, they were given some excellent peaches.

In midsummer he dwells on the very hot and dry weather, which was apparently new to him. June 8th-9th the weather was very hot, and June 11th, "No rain has fell here since the 24th of May, & then but a Scanty Shower, & most of the time since windy," and from that time on until the first of September he records chiefly hot weather, long intervals between, or only slight rains, frequently commenting on the dry appearance of vegetation, and every shower that fell—after one occurring July 15th he says: "The Corn literally looks glad." To those acquainted with Virginia summers, his picture of dry and dusty vegetation is particularly appealing, but it seems equally natural to read of cool days in the middle of June, requiring fires in the Great-House and School-Room; and again in July when he notes chilly mornings, and on July 25th actually finds the day "disagreeably cold."

Although less conscientious in recording the weather than many diarists, Fithian gives a very good idea of the climatic changes, and constantly makes observations on other aspects of the season. On March 11th he notes "Robbins, & Blue Birds singing all around us," and on the same day hears the song of the Mocking Bird; on the 31st "The Plumb-Trees are beginning to blossom," and on the 3d of April he writes: "The country begins to put on her Flowery Garment, & appear in gaity," with apricots, peaches, plums, and several sorts of cherries in bloom, remarking in this connection that the peach orchards of Nomini are very extensive. On the 7th of the month, "We rode across the Country which is now in full Bloom," and again on the 10th, he comments on the "Country full of Flowers, & the branches full of lovely singing Birds." It is a very different picture that he gives in midsummer, when he writes on August 18th: "The Face of the earth seems covered with mocking-birds, but not one of them sing . . . Not a bird, except now & then Robbin-Redbreast is heard to sing in this Feverish Month."

Fithian did not leave Nomini until the 20th of October, 1774, but makes no allusions to the garden during the latter portion of his stay, evidently preferring to go farther afield for his recreation. On September 19th he records: "Evening after School with Mrs. Carter, & the Girls I took a Walk thro' the Pumpkin & Potatoe Vines," but more often he would ride to some neighbor's, or "The much Frequented Corn-Field," or would go afoot for a long stroll through the pasture, admiring "The Country emphatically in her goodly Variety!"

Modern Varieties of Vegetables

VICTOR R. BOSWELL[1]

Over a two-year period, during 1944 and 1946, I prepared a series of articles on "Disease-Resistant and Hardy Varieties of Vegetables" that appeared in *The National Horticultural Magazine*. In those articles I gave a little early background on the development of disease-resistant and hardy varieties, then very briefly described or discussed a large number of such varieties that had been developed up to that time. The main purpose was to present a sort of "catalog" of what was available. Many of the varieties mentioned in those articles are important in one or more parts of the country today although others have been superseded by better ones.

It is hardly feasible or even desirable here to review all of the varieties mentioned in those articles, or any large portion of them. Although some of the more important of those varieties may be mentioned again here, a major purpose of this article is to call attention to new varieties of interest that have been produced in the past eight to ten years. Before taking up specific varieties of the several garden vegetables, however, it seems worth while to consider some recent and current trends in varietal developments, the reasons for them, and how all these matters affect the non-commercial vegetable grower.

Some Trends

From the very beginnings of agriculture and of gardening man has sought kinds, varieties, and stocks of plants that would be more productive than those already possessed, and that would better satisfy his desires. The commonest need has been for plants that would increase food supplies through greater yield, better storability, higher food value, or any combination of such qualities. More than bare need, however, has been involved in the "improvement" of plants. After bare needs are met, esthetic considerations become important. Whether or not a new set of qualities represents an "improvement" over older varieties depends upon what is needed, and upon what is wanted. It is often a matter of opinion as to whether a particular variety is as good or better than some other.

Disease resistance. The outstanding trend in vegetable variety improvement now, and for the past thirty years, is the development of new varieties resistant to specific diseases. This trend has been compelled by progressively greater losses or threats of loss from plant diseases. It has resulted from real necessity. It is a fight for food.

All agriculture is artificial, by definition. It disturbs natural balances. Under the economic and social pressures of today many agricultural practices or methods are becoming even more highly artificial or "unnatural," tending to upset natural balance still further. Thus, we encounter more and more troubles with diseases and disorders of many kinds.

We may confidently expect to see a continuation of breeding of vegetables for resistance to old diseases that are becoming more wide-spread and serious, and also for resistance to new forms of disease that will appear in the future.

Adaptability to climate. Great shifts

[1]U. S. Department of Agriculture, Agricultural Research Service, Horticultural Crops Research Branch.

in population create new problems in food supply. These shifts create demands for new varieties that will be suited to new centers of agricultural production and to some extent to new centers of urbanization and industrialization. Wherever masses of people migrate, they want to take garden crop plants with them, or find new ones that will meet their needs in the new circumstances.

New frontiers are being developed in the North, for example, which call for new varieties. New mining, power, and agricultural developments in various parts of Canada; new activity in Alaska; and large new power and irrigation developments in some formerly isolated semi-desert or desert areas of the western United States are intensifying demands peculiar to those areas. We, in the United States, have been little concerned with the northernmost limits of culture of various vegetables and have done comparatively little to extend the northern limits of any of them. To the Canadian gardeners and plant breeders, however, this is a major field of interest. Our Great Plains area is still very inadequately supplied with suitable varieties, as is the comparable area in Canada.

Slow but steady progress is being made in developing a few varieties especially adapted to this or that; adverse climate; tomatoes and vine crops for the plains and intermountain area; tomatoes, sweet corn, and vine crops for the North. Although a great part of the supply of most kinds of vegetables may continue to be shipped in to such areas, there will be increasing numbers of residents who will want to grow their own.

Adaptability to commercial production. We often hear the complaint that the home gardeners have been forgotten by the plant breeders, that the new varieties are suited only to commercial production and do not have the fine quality of this or that old home garden sort.

Such an extreme view is hardly justified although it is true that most efforts at vegetable variety improvement recently have necessarily taken commercial requirements into account. The only instances in which commercial and home garden requirements appear to be in actual conflict involve the bearing habit or harvest range of various crops. The commercial grower wants to be able to harvest a planting of beans, sweet corn, cabbage, lettuce, peas, or certain other crops, in a single operation, by passing over the field just once. The home gardener, on the other hand, usually wants the harvest range prolonged so he can harvest repeatedly from a single planting.

In a commercial variety, high eating quality is no less desired than in a variety for home culture; neither is high quality any less desired than high yield. It should be remembered, however, that, in breeding new varieties resistant to some costly destructive disease, the first objective is to get a variety that will be productive and *reasonably* acceptable. Remember that this is a fight for food. Early in the course of varietal developments some compromise with the ultimate in quality often must be made. Later, better varieties are developed that have very high quality as well as productivity and suitability for mechanized production. Varieties such as 'Topcrop' bean and 'Golden Cross Bantam' sweet corn are among the very best in eating quality although they were produced to meet certain commercial requirements.

Before we complain too bitterly about the qualities of some of the modern disease-resistant varieties . . . before we rate them too unfavorably in comparison with certain old favorites, we might be reminded that the old favor-

ites may no longer produce an acceptable crop. Not only the yields but also the quality of many old favorites suffer seriously from diseases that are now prevalent. Under present conditions such old sorts are not superior to the new varieties that have replaced them.

Suitability for processing. The increasing trend toward food prepartion in the factory instead of in the home has required definite improvements in uniformity and in quality of vegetable varieties grown for commercial processing. Both competition and grading standards for processed food have contributed to the high quality of varieties for processing. The best varieties for fresh use or for canning are not necessarily the best for freezing. Both private and public agencies devote much attention to breeding varieties specifically for processing. In this particular field the home gardener profits no less than the commercial grower and the purchaser of processed vegetables.

Hybrids. The success of hybrid corn and sweet corn started a trend to F_1 hybrids[2] with some other vegetable crops, but it was only a start. Application of the principles used in producing hybrid corn has been very slow and very limited in this country with crops other than corn because of the cost of emasculation of plants used as female parents. Thus far those principles have been used to a small extent on tomato, eggplant, cucumber, and squash. The discovery of principles and development of methods by Henry A. Jones for using cytoplasmic male sterility, as exemplified in the production of F_1 hybrid onions, have greatly increased the practical possibilities of F_1 hybrids of many crops. Commercial production of F_1 hybrid onion seed is now well established. The new principles will doubtless be employed successfully with other vegetables.

The high cost of producing F_1 hybrid seed by the old principles has been a real obstacle to its general extension to crops such as tomato, eggplant, pepper, and cucumber in this country. For several years, however, seed producers in Europe and in the Orient have been prepared and eager to produce such hybrid seed for Amercian growers at prices that would appear mutually advantageous. It is surprising that Americans have not made more use of those facilities abroad.

Home garden varieties. Although the tendency today is for most plant breeders to give major attention to varieties that will meet commercial needs, many varieties are being introduced which are of interest mainly to home gardeners. If a breeder finds an outstanding home garden sort, he will not hide it or discard it, but will introduce it. Many such introductions, however, fall by the wayside and disappear. They may make progress very slowly or may entirely fail to win an important place for reasons other than their eating quality or yielding capacity.

To remain in use nowadays, a home garden variety must be suited to culture over a fairly wide range of conditions. Unless its qualities can create demand for a fair volume of seed annually, many seed producers are reluctant to produce it. Small lots of seed are expensive to produce and to handle, resulting in little or no profit to the seedsman. Some excellent home garden sorts are poor seeders, require greater expense, or involve greater hazards than others in producing seed. Seed producers have an understandable lack of enthusiasm for such varieties and tend to let them slip out of production unless there is a brisk demand for them.

If large numbers of home gardeners demand certain varieties year after

[2]The first generation seedlings raised from a cross of two kinds of plants.

year, seedsmen will produce them whether the varieties are very good or not. Look at 'Ponderosa' tomato! You can buy seed of it anywhere, everyone knows it, and yet it is not a very good variety. It is just one of those things that caught the fancy of gardeners because of its size. It is rough, there is much waste in its preparation, it is a temperamental fruit-setter, drops blossoms very badly, is highly susceptible to wilt and other diseases—in short, we don't recommend it.

It is surprisingly difficult to "sell" some very good varieties to home gardeners because the varieties do not appear spectacular at a glance. 'Ponderosa' is spectacular in fruit size, but not in yield or dependability. 'Wando' pea, on the other hand, is a remarkably dependable variety of high quality—resistant to wilt, to heat, to cold, and very widely adapted as a home garden pea. Still, 'Wando' is largely unknown and making slow progress. Some seed producers report a gradually increasing volume of sales of 'Wando,' but its values are not widely appreciated. It is not spectacular; it has no "gimmick" that is evident on sight. 'Slobolt' and 'Salad Bowl' lettuces are remarkably heat resistant and slow bolting, excellent home garden sorts released in recent years, but they are not yet big items in the home garden seed trade.

It may be that one reason special home garden varieties seem scarce is that home gardeners don't demand those we have in sufficient volume to encourage seedsmen to stock them.

Seed quality. For many years the trend in quality of vegetable seeds has been upward, and it is still upward. Several factors doubtless are responsible for the generally fine quality of seeds available to gardeners in this country.

We have many highly competent and responsible commercial seed producers and dealers. We also have seed laws designed to protect gardeners and responsible seedsmen from the consequences of irresponsible seed production and marketing. A very effective collaboration has developed between government control officers and representatives of the seed industry in the United States for improving seed quality and seed marketing practices. We may confidently expect both of these to continue at highly satisfactory levels.

Seed catalogs. It was not long ago that the vegetable seed catalog was referred to in jest, and otherwise, as a prime example of printed deceptiveness and misinformation. Present trends continue away from that sort of thing. To an increasing degree seedsmen are devoting catalog space to the bad points as well as the good ones possessed by the varieties they list for sale. We now find such statements as: "Not the best market type but a vigorous productive hybrid that stands up where others fail," "susceptible to fusarium wilt," "tends to produce rabbit ears," "not very prolific," "smooth, straight, blunt-ended fruit but only fair color. Often profitable." Yes, we have come a long way.

Some Recommended Varieties—New And Old.

Some kinds of vegetables include very widely adapted varieties that can be grown with satisfaction anywhere that the vegetable is grown. In the following sections of this article that deal with such crops, no mention is made of specific regions or districts for growing the varieties named. Most vegetables, however, consist of varieties that are much better for growing in some parts of the country than in others. Special attention should be given to the varieties recommended for one part of the country in preference to another. Many failures result from the

choice of the wrong variety for a given region, or for the season in which the vegetable is to be grown. Season of culture is often as important as place in determining which varieties should be chosen.

In this article it is feasible to deal only with the more important vegetables, and to mention only a few of the best or of the more promising varieties of each for specific regions or seasons. Failure to mention any specific variety does not mean that it is without value in one or more areas.

Beans. Many breeders working in private seed companies and in public research institutions have introduced a large number of good new varieties of garden beans in the past ten years—and many old varieties are still going strong.

Pole. Among the old varieties of pole snap beans, 'Kentucky Wonder' is the nationwide and perennial favorite. No other approaches it in general adaptability and popularity. 'White Kentucky Wonder,' resistant to certain forms of rust, is the second most important pole variety. 'McCaslan' is next to the 'KentuckyWonders' in popularity. 'Blue Lake' is best adapted to the Pacific Northwest where it is grown commercially for processing. These four pole beans become stringy as the pods become large but they are nonetheless popular.

Strains of 'Stringless Blue Lake,' with resistance to mosaic and to some forms of rust, have recently been introduced. 'Rialto,' a stringless bean of the 'White Kentucky Wonder' type, and 'Potomac,' another new stringless pole bean, are both somewhat resistant to mosaic and to some forms of rust.

Bush. Since the first mosaic-resistant snap bean, 'Wisconsin Refugee,' was introduced in 1934, at least a dozen better ones have been introduced. Varieties of Refugee type, such as 'Idaho Refugee,' Flight,' and 'Ranger' are better adapted to the northern part of the country than to the South; 'Contender,' a new, very early sort, is best adapted to the South, and 'Florida Belle' to Florida.

'Topcrop,' a new bean of outstanding quality, does best in the northern half of the country; it bears most of its pods in one picking, nearly all in two pickings. This feature is an advantage to the home gardener if one wants to do a big job of canning or freezing all at once and get it over with. For the gardener who wants many harvests at short intervals, many small plantings of this variety at intervals of ten days should be made. 'Wade' is another new bean developed in the South, as were 'Contender' and 'Florida Belle.' 'Wade,' however, promises to be popular over much of the country. It yields its pods over a long harvesting season. 'Tenderlong 15' and 'Improved Tendergreen' were developed to replace the old variety 'Tendergreen' which is highly susceptible to disease. 'Idaho Refugee,' 'Flight,' 'Ranger,' 'Contender,' 'Florida Belle,' 'Topcrop,' 'Wade,' 'Improved Tendergreen,' and 'Tenderlong 15' are resistant to mosaic. 'Contender,' 'Wade,' and 'Tenderlong 15' are also resistant to certain strains of powdery mildew.

Lima bean. The northernmost States and districts of high elevation are generally less suitable for growing lima beans than the warmer parts of the Middle and Southern States. This applies especially to the pole varieties, but is also true for the bush varieties. The small-seeded varieties are hardier and more dependable croppers than the large-seeded ones under adverse conditions.

Pole. The pole type of lima bean is best suited to the southern half of the country. We probably have no better pole varieties than the old 'King of the Garden' (large seeded) and 'Sieva'

(small seeded). For growers who do not object to colored seeds, the old 'Florida Butter' is a vigorous and productive variety.

Bush. 'Henderson Bush,' until recently the only very important small-seeded bush variety, is still a dependable one. It is, however, being gradually replaced by a few new small-seeded sorts that are either of higher quality or that have seeds which remain an attractive green color well past the best harvest stage. Although these green-seeded varieties are attractive and popular, the green seed color can be deceptive as to quality because it will mask over-maturity of the beans. 'Clark's Bush' and 'Thorogreen' are two small-seeded varieties similar to Henderson except that they are green-seeded.

The large-seeded bush varieties are generally considered of better quality than the small-seeded but they require a little longer season and warmer weather. 'Fordhook 242' and 'Concentrated Fordhook' are relatively new varieties that are of excellent quality and generally more productive than the old 'Fordhook' which they are replacing.

Several small, thick-seeded limas have been developed in recent years but few of them except 'Triumph' are commonly available. These can be grown in areas where 'Henderson Bush' can be grown but which may be too cool for the very large-seeded bush varieties and the pole varieties.

Beets. Beet varieties differ chiefly in shape and color of root, with the long ones requiring up to ten or eleven weeks to make a crop in contrast to only eight or nine weeks for flat and round varieties. If the normal growing season is very short or cool, the quick-growing kinds, such as 'Early Wonder,' should be grown. 'Detroit Dark Red,' 'Perfected Detroit,' and similar strains, are most popular and productive. No variety thrives best in hot summer weather.

Broccoli. Broccoli varieties differ chiefly in time to harvest and in the character of flower heads they produce. The old well known 'Calabrese' is among the earliest. A new early variety, 'Di Cicco,' is popular. Those who want several small heads instead of a large central head should grow 'Freezers.' This variety was developed especially to meet the requirements of packaging for freezing.

Cabbage. A succession of yellows-resistant cabbage varieties has been coming from the breeders' hands for more than thirty years. We now have good resistant varieties for virtually every season, region, and consumer demand—early, medium, late, pointed, round, flat, red, green, for fresh use, for kraut, or for storage.

For over-wintering as small plants in the field, 'Early Jersey Wakefield' and 'Charleston Wakefield' are the hardiest and the least likely to form seedstalks in the spring instead of heading. These varieties can be over-wintered successfully under conditions typical of the Chesapeake Bay region where temperatures occasionally approach zero. Such temperatures will kill other common varieties. The two varieties are not wilt-resistant. They have pointed heads and have lost much of their former popularity as market sorts, but they can be over-wintered farther north than others.

Many varieties can be planted in autumn for early spring harvest in the warmer half of the country and are so grown. Losses are often heavy, however, either from winter killing or from shooting to seed instead of making heads.

A very hardy, round, non-bolting cabbage has been sought for many years with no marked success.

In the warmer parts of the country for a spring crop, early-maturing varieties should be grown in order that they will reach harvest before they are harmed by hot weather. To avoid being swamped with too much cabbage at once, the home gardener should plant only a few plants each of three or four varieties that reach harvest several days apart. Three good ones for spring planting, in order of earliness, are 'Golden Acre,' 'Copenhagen Market,' and 'Glory of Enkhuzen.' If the soil is infected with yellows, 'Resistant Golden Acre,' 'Marion Market,' and 'Globe' should be grown. 'Bonanza' is a new midseason cabbage reported to hold very well in the garden without bursting after it becomes firm.

Cabbage for autumn harvest is difficult to grow in the warmer half of the country because it must be subjected to unfavorably hot weather during the early part of its growth. In the Middle States, however, some moderately heat-tolerant varieties, such as 'Succession,' 'Wisconsin All Seasons,' and 'Steins Flat Dutch,' can be grown to reach harvest about frost.

The storage varieties, such as 'Wisconsin Hollander,' and 'Wisconsin Ball Head,' are adapted only to the more northerly States. They require a long growing season and will not tolerate long, hot summers. Other late varieties, such as 'Late Flat Dutch' and 'Red Rock,' are adapted only to the more northerly or cool coastal districts.

Collards. It is unfortunate that collards, a staple greens crop of the South, is not more generally known and appreciated in the North. It is no less well adapted to northern gardens than to southern gardens. A leafy, nonheading cabbage, it is hardy, grows rapidly, is productive and very easy to grow. Its season of culture and use is the same as that of kale.

Few varieties are listed, there are minor differences among them, and they are equally adapted to various parts of the country. The best known named variety is 'Georgia.' 'Louisiana Sweet' and 'Vates' are two varieties, developed in Louisiana and Virginia, respectively, which are more uniform and refined than most stocks of Georgia.

Carrots. The carrot generally does not thrive on hard, tight soils that are low in organic matter or on rocky soils. Neither does it do well in areas where hot dry weather overtakes it. Good stands are very difficult to obtain under such soil and climate conditions. The average home garden over most of the country is not very well suited to culture of carrots, especially the longer varieties, although carrots can be grown. For locations having heavy, stony or shallow soils that are unsatisfactory for long varieties, 'French Forcing,' a round one, or 'Oxheart,' a short one, may do reasonably well. These varieties are also the earliest and may therefore fit into seasons too short for the longer season varieties. Where conditions are reasonably favorable for carrots, 'Nantes' is one of the best for home gardens because of its high quality. 'Chantenay' is also good. 'Imperator' and 'Morse Bunching' are the main long varieties.

Sweet corn. The hundreds of names of sweet corn varieties and hybrids put us all in somewhat of a dither. Although many of the varieties and hybrids are very similar to some others, there still are highly important differences among them. To complicate matters still further, the lists of hybrids available change rather rapidly. Since many sweet corn hybrids are adapted to a relatively narrow range of conditions, generalized recommendations about hybrids are unsafe. Recommendations should be based only on actual trials in each district where it is pro-

TABLE 1

Some of the principal features of some sweet corn hybrids and varieties commonly grown in the United States

Variety or hybrid	Kernel color[b]	Time to harvest *Days*	Ear length *Inches*	Rows of kernels *Number*	Plant height *Feet*
SMALL TO VERY SMALL VERY EARLY KINDS, 65 TO 74 DAYS TO HARVEST[a]					
'Earligold'	Y	73	7	12	6
'Early Surprise'[c]	Y	72	7	8–12	5
'Golden Early Market'[c]	Y	73	6½	8–12	4½
'Golden Midget'[c]	Y	70	4	8	3
'Golden Rocket'	Y	67	7	10–12	5
'Golden Sunshine'[c]	Y	74	6½	10–12	5½
'Marcross'	Y	74	7½	10–14	5½
'North Star'	Y	70	6½	8–12	5½
'Seneca Dawn'	Y	70	7½	12–16	5
'Seneca Golden'	Y	72	7	12	5½
'Seneca 60'	Y	67	6½	10–12	4½
'Spancross'	Y	70	6½	10–12	5½
SMALL EARLY KINDS, 75 TO 80 DAYS TO HARVEST[a]					
'Carmelcross'	Y	77	7	12–14	5½
'FM Cross'	Y	80	7	14–16	6
'Golden Bantam'[c]	Y	78	6½	8	5½
'Gold Rush'	Y	77	7	12–14	6
'Midgolden'	Y	78	7½	10–14	6
'Northern Cross'	Y	77	7	10–14	6½
'Tendergold'	Y	80	7½	10–14	6
MEDIUM TO LARGE MIDSEASON KINDS, 81 TO 89 DAYS TO HARVEST[a]					
'Aristogold Bantam Evergreen'	Y	87	9½	16–18	7
'Calumet'	Y	86	8½	10–16	7
'Erie'	Y	88	9	12–14	6½
'Golden Bounty'	Y	83	9	12–14	7½
'Golden Cross Bantam'	Y	85	8	10–14	6
'Golden Hybrid 2439'	Y	87	7½	12–16	7
'Golden Security'	Y	85	8	14–16	7½
'Howling Mob'[c]	W	83	7½	12–16	7
'Huron'	Y	89	9	12–16	7
'Illinois Golden Hybrid No. 10'	Y	86	7½	12–14	6½
'Ioana'	Y	87	8	12–14	6½
'Kennebec'	Y	82	7½	12–14	6
'Lee'	Y	84	7½	12–16	6½
'Lincoln'	Y	83	7½	12–16	6
'Oto'	Y	87	9	8–12	7
'Seneca Chief'	Y	85	9	12	6½
'Top Cross Maine Bantam'	Y	83	7½	12–16	6
'Whipple Early White'[c]	W	84	6½	14–18	6
'Whipple Early Yellow'[c]	Y	85	7	12–14	7
LARGE LATE KINDS, 90 DAYS OR OVER TO HARVEST[a]					
'Country Gentleman'[c d]	W	95	7	([d])	7
'Country Gentleman 8x6'[d]	W	95	8	([d])	7
'Country Gentleman (Ill.) No. 13'[d]	W	97	7½	([d])	7½
'Honey June'[c]	W	105	8	12–18	9
'Iochief'	Y	90	9	14–18	7
'Iogent No. 11'	W	98	8	([d])	8
'Iogreen'	W	95	7½	20–26	8
'Narrow Grain hybrid'	W	95	8	([d])	8
'Stowell Evergreen'[c]	W	95	8	16–20	8½
'Stowell Evergreen hybrid 14x13'	W	96	8	14–18	8

[a]Days to harvest are the approximate number of days from planting to harvest when planted about the frost-free date in a region or season having a monthly mean temperature of 70° to 75° F. during most of the growing season. Mean growing season temperatures as low as 65° will increase the time to harvest by about 15 to 20 days for most varieties.

[b]Y indicates yellow kernels; W, white.

[c]Open-pollinated variety.

[d]Nonrowed variety.

TABLE 2

Some sweet corn varieties recommended for growing for home and market in several areas of the United States.

[The later varieties adapted to an area are generally preferred because they are more productive than equally adapted early varieties]

Area	Some varieties recommended
Extreme southeast	'Golden Cross Bantam,' 'Ioana,' 'Aristogold Bantam Evergreen,' 'Illinois Golden Hybrid No. 10,'[a] 'Golden Security,' 'Erie,' 'Calumet.'
Middle South	'Aristogold Bantam Evergreen,' 'Golden Cross Bantam,' 'Ioana,' 'Golden Security,' 'Golden Hybrid 2439,' 'Illinois Golden Hybrid No. 10,' 'Erie,' 'Calumet.'
Texas	'Ioana,' 'Aristogold Bantam Evergreen,' 'Golden Cross Bantam,' 'Calumet.'
Middle Atlantic	'Calumet,' 'Carmelcross,' 'Aristogold Bantam Evergreen,' 'Golden Cross Bantam,' 'Ioana,' 'Iochief,' 'Golden Security,' 'Stowell Evergreen hybrid,' 'Country Gentleman,' and 'Country Gentleman' hybrids.
Northeast[b] [e]	'Marcross,' 'Carmelcross,' 'North Star,' 'Northern Cross,' 'Golden Rocket,' 'Golden Cross Bantam,' 'Ioana,' 'Seneca Chief,'[d] 'Calumet.'
Corn Belt[c]	Same as for northeast area.
North Central[e]	'Spancross,' 'Marcross,' 'Carmelcross, 'Golden Rocket,' 'Gold Rush,' 'Golden Cross Bantam,' 'Ioana.'
Northernmost central and northeast	Only small, early varieties are suitable. Nothing later than 'Golden Bantam' (*not* 'Golden Cross Bantam') is recommended. See Table 1. Note: All varieties are 2 to 3 weeks later than in warmer parts of the country.
Western "intermountain."[c]	'Marcross,' 'Carmelcross,' 'Seneca Golden,' 'Golden Cross Bantam,' 'Ioana,' 'Illinois Golden Hybrid No. 10.'
California	'Golden Cross Bantam,' 'Ioana,' 'Seneca Chief,'[d] 'Marcross,' 'Carmelcross.'
Pacific Northwest	'Spancross,' 'Golden Rocket,' 'North Star, 'Carmelcross,' 'Seneca Chief,'[d] 'Golden Cross Bantam,' 'FM Cross.' Note: All varieties 2 to 3 weeks later than in warmer parts of the country.

[a]Especially in the Everglades.
[b]Varieties for West Virginia are in this group rather than in the Middle Atlantic group.
[c]The earlier varieties shown are better adapted for the cooler districts of the area.
[d]Chiefly for home use and local market.
[e]The later varieties are adapted to the warmer parts of the area.

posed to grow a particular hybrid. With few exceptions, individual hybrids are less widely adapted than the old open-pollinated varieties. At the same time they may be highly superior to other varieties and hybrids in those particular districts or regions to which they are well suited.

Despite what has just been said in the preceding paragraph, a few hybrids have shown a wide range of adaptability and will give good results anywhere that the season is long enough and warm enough for them to reach the harvest stage. Among such hybrids, 'Golden Cross Bantam' is outstanding both in quality and in performance. Although some newer hybrids are higher yielding in various regions, 'Golden Cross Bantam' is still "tops" in quality and its yielding capacity is very satisfactory. 'Golden Cross Bantam' can be grown in all except the northernmost States.

For regions too cool for 'Golden Cross Bantam,' many early sweet corns of high quality are available, some of which are shown in Table 1. Gardeners who wish to try midseason kinds other than 'Golden Cross Bantam,' or late kinds, will find several listed in Table 2 and briefly characterized in Table 1. Early and midseason hybrids resistant to bacterial wilt should be grown. The

old early open-pollinated varieties are generally very susceptible.

Cucumbers. In most districts the harvesting season for cucumbers is cut short by the inroads of downy mildew. Resistance to mildew which will permit an extension of the harvesting season has long been sought. 'Santee' has considerable resistance and 'Palmetto' has high resistance to this disease. They are both widely adapted slicing varieties. 'Niagara' is a new slicing variety resistant to mosaic. Of the pickling type, 'Ohio MR 17' and 'Yorkstate' are two new sorts having some resistance to mosaic.

Although not disease resistant, 'Marketer' has proved to be a widely popular slicing type, and 'National Pickling' is one of the best non-resistant picklers.

Some firms have been offering F_1 hybrid cucumber seed for several years. Since the seed is relatively expensive, these hybrids have not become important for commercial field culture. Hybridity in itself is no assurance of superiority—a hybrid may be equal, inferior, or superior to an open-pollinated variety. Among those, however, that have been available for some time, 'Burpee Hybrid' and 'Surecrop' are well worthy of trial to determine how they compare with better known open-pollinated varieties under various conditions. Experience with the hybrids is still relatively limited.

Eggplant. Few home gardeners grow eggplant. It is definitely a hot weather crop. The introduction of 'New Hampshire' improved the chances of success in the northernmost States. 'Blackie,' developed in Canada, has never become popular in the United States. Phomopsis rot is a serious disease of eggplant. Two new varieties for the South, 'Florida Beauty' and 'Florida Market,' are resistant to this disease.

F_1 hybrid eggplant has been grown in Japan for many years. 'Black Magic Hybrid' and 'Burpee Hybrid' are F_1 hybrids recently produced in this country.

Endive. This salad plant is especially valuable for late summer or fall culture in the southern half of the country where temperatures are too high for good results with late lettuce. Either the broad-leaved or the curled-leaved type is very easily grown and both produce an abundance of attractive salad greens that will stand for a considerable time in the garden without loss. It is hardy to light frost but will not stand hard freezing. 'Full Heart' is a good broad-leaved variety of the type called escarolle; 'Ruffec' and 'Pancalier' are popular curled kinds. If planted too early, this plant tends to shoot to seed instead of making a nice rosette.

Lettuce. It seems that almost everyone wants to grow in their gardens hard cabbage-headed varieties of lettuce such as can be bought in the markets the year around. In most of the country, conditions are not favorable for growing such varieties as 'Great Lakes,' 'New York' and the several strains of 'Imperial.' Head varieties of lettuce are very exacting in their requirements, especially the crisp-head varieties named. High temperatures are conducive to tipburn and to bolting to seed before good heads form.

In the cooler districts of New York, New England, the Pacific Coast, the vicinity of the Great Lakes, and at high elevation in the West, 'Great Lakes' is the easiest crisp-head variety to grow in summer. It can also be grown in spring and fall in coastal areas that have long cool seasons. 'Great Lakes,' however, is rather indifferent in quality. In areas and seasons just described, 'Imperial 847' can be grown. In the lowermost South, 'Great Lakes' and 'Imperial 44' are recommended for winter. 'Imperial 456' (Cornell 456) is

recommended for the Northeast, especially on muck soil. The Imperial strains are of higher quality than 'Great Lakes.'

Many gardeners prefer the eating qualities of the butterhead lettuces, such as 'Big Boston.' The butterhead varieties are a little less exacting in their requirements than the crisp-head ones, but are still difficult to grow well except in regions of long, cool seasons. The little 'Mignonette' is perhaps the surest-heading of any of the commonly available head lettuces, but it is small and not to be compared with the large market sorts.

By starting plants in hotbeds and setting them in the garden when about two inches tall two to three weeks before the average date of the last frost, many of the heading varieties listed above will make fair heads even in the warmer parts of the country. Unless, however, the gardener knows he is located in "head-lettuce country" and can get a bit of local guidance, he might do better to forget the heading varieties and depend on a good leaf lettuce. Incidentally, 'Prize Head' is *not* a head lettuce—it is a leaf lettuce with reddish-brown leaves.

Two new leaf lettuces are especially valuable for the home gardener because of their resistance to heat and their long standing qualities: 'Slobolt' and 'Salad Bowl.' The latter has deeply cut leaves. 'Grand Rapids' and 'Black Seeded Simpson' are good old leaf lettuces but they bolt to seed sooner than 'Slobolt' or 'Salad Bowl.' 'Grand Rapids' also has the undesirable habit of slow germination, especially in warm soil.

Onions. Length of day is one of the factors governing the formation of bulbs of onion. That is why certain "northern" onions, such as the 'Yellow Globe' strains, can not be grown successfully during the winter in the South. Temperature, soil, and other conditions may be entirely favorable but the days are too short for 'Yellow Globe' to form a bulb. Conversely, there are certain "southern" varieties that can not be grown successfully in the North during summer because the days are too long. 'Red Creole' and 'White Creole,' for example, are suited only to short days; they are grown in winter in the Gulf Coast area. If one tries to grow either of these as a summer crop in the North, the long days cause it to form a bulb and terminate its first season's growth quickly and while it is very small. Again, temperature and soil may be entirely suitable but at the latitude of Washington, D. C., spring-planted 'Red Creole' forms a bulb about the diameter of a nickel, and stops growth.

The Bermuda type of onion and 'Early Grano' will bulb on short days but neither is much of a success when grown during long days. That is why these must be grown as early onions in the South and Southwest. They make better bulbs under moderately long days than the Creole type but still they are definitely not northern onions. 'Excel' (Bermuda 986) is one of the best.

'Sweet Spanish' and its strains do best if they approach maturity under medium day lengths. They can be grown successfully over much of the country but are not recommended for either the southernmost or the northernmost districts. In the middle parts of the country where summer temperatures run high, 'Sweet Spanish' should be grown from transplants to enable it to make a good crop before it encounters too much unfavorable weather. The 'Utah' strain is one of the best 'Sweet Spanish' sorts.

Several varieties of 'Yellow Globe' type compose the most important group of northern onions. These are

hot, firm-fleshed, long-storing kinds that require long days for satisfactory development. They are best adapted to districts in the northern third of the country. 'Early Yellow Globe,' 'Brigham Yellow Globe' and 'Yellow Globe Danvers' are good varieties of this type. 'Southport Red Globe,' 'Southport White Globe,' and 'Red Wethersfield' are distinctly northern varieties.

Dry onion sets are necessarily of the hot-fleshed, firm, storage type of onion. They are good for a quick crop of green onions almost anywhere but are suited for good bulb production only in the northern half of the country.

The most important development in crop breeding in more than 25 years is the discovery and recent application of cytoplasmic male sterility to production of F_1 hybrids, as in the onion. Since 1950, commercial supplies of new F_1 hybrid onions have become widely available. Gardeners who grow their own onion bulbs should try a number of these. 'Granex' is a well proven hybrid of Bermuda type; it should be grown only where Bermudas are suited. A limited number of northern hybrids are available from commercial sources, but they are still very new and the characteristics of commercial offerings are improving rapidly. Any specific recommendation here at this time will doubtless soon be out of date. Several new northern types and some 'Sweet Spanish' types are about to be put into production as this is written (1953) but are not yet available. Readers are urged to be on the alert for fine new storage hybrids — they certainly will be available soon.

Peas. The greatest change in garden peas in recent years is that their production in home gardens and market gardens is giving way to the commercial quick-frozen product. Despite the fine quality that can be obtained from good varieties in the home garden, the space and labor for growing, and the labor of harvesting and shelling appear less and less attractive in comparison with the ease of using the high quality, commercially frozen product that is all ready to put in the pot. If space is limited or hands are scarce, it is difficult to justify peas in the home garden. Furthermore, the pea is a distinctly cool-climate crop that does well only in places where it can make a crop before hot weather overtakes it.

In much of this country the spring season is too short to get really good results with most varieties. In the South during the winter there is the hazard of cold. In the northernmost States, in cool coastal districts, and at high elevation, almost any variety can be grown as a spring-sown crop. In the middle part of the country hot weather comes so early that only early varieties should be grown, in order to avoid the hot weather. And, regardless of place or variety, spring peas must be sown early. Delay in planting greatly reduces yields and the reduction is more severe in late varieties than in early ones.

Most important varieties of peas now are resistant to wilt. Under borderline conditions, 'Alaska,' a smooth-seeded pea, has long been considered most dependable although many people do not like its eating qualities as well as those of wrinkle-seeded varieties. 'Surprise' is one of the earliest wrinkled peas. 'Little Marvel' is an old medium-season variety of reasonably wide adaptability and high quality that remains fairly popular for home gardens. 'Wando' is a relatively new variety noted for its resistance to both heat and cold, its general hardiness, dependability and good quality. Not yet grown in large volume, its value is becoming gradually better understood and a number of dealers report a steady increase in amounts of seed sold. 'Wando'

was originally developed as a cold-hardy pea for winter culture in the South but it is gaining popularity elsewhere in the country.

Peppers. Peppers should be grown more extensively and used more generously by the home gardener. Use need not be confined to a few slices in a salad or to an occasional meal including stuffed pepper. Peppers make an excellent dish as a "straight" vegetable, and they are not very hard to grow. A number of early varieties, such as 'Vinedale,' 'Windsor A,' and 'King of the North,' are now available for gardeners in the more northerly States and moderately high elevations.

For most of the country, 'California Wonder' is generally desired because of its nice form. It is, however, perhaps a little more sensitive to adversities of soil and climate than 'World Beater'—not quite so pretty a variety but often more productive than 'California Wonder' and of very satisfactory quality. 'Early California Wonder' is often recommended but it is definitely much more sensitive to environment than 'California Wonder.' Under somewhat adverse conditions it may be quite a disappointment.

'Perfection' pimiento is another very fine pepper in those places to which it is well suited, but its range of adaptability is limited. It is late, seems to require a longer season, warmer weather, and better soil conditions than the varieties mentioned above. 'Perfection,' or improved strains of it, is the variety grown almost exclusively for canning as "pimiento pepper." It is of doubtful superiority in most of the middle third of the country, and certainly not recommended for the northern third or other cool areas.

Potatoes. White or Irish potatoes can be grown at some season of the year in any place in North America where a vegetable garden can be grown successfully. The species is very widely adapted but some good varieties are rather narrowly adapted, while others are moderately wide in their range of adaptability. In the past twenty years about forty new varieties have been introduced by breeders in the United States. Most of these varieties are resistant to one or more important diseases, and half of them are of enough importance to be on the certified seed lists. They make up over half of the certified seed grown annually in this country.

There is no single variety of potato that is best in all places and all seasons. When a variety is grown in a place to which it is not adapted, its quality, as well as its yield, is likely to be poor. It is therefore important to know *what* variety to grow *where.* Broad recommendations of varieties for the home gardener are briefly summarized in a current publication of the U. S. Department of Agriculture as follows:

"In the northern, or main potato-growing region two types of potatoes should be planted: One that produces tubers early for summer use and the other, requiring a longer growing period, for winter use. Both should be planted as early as conditions permit. Varieties of the first type are 'Irish Cobbler,' 'Warba,' and 'Red Warba.' 'Chippewa,' a mid-season variety, usually gives high yields of high-quality tubers. The best late varieties are 'Katahdin,' 'Green Mountain,' 'Sebago,' 'Sequoia,' 'Pontiac,' and 'Rural New Yorker No. 2.' 'Irish Cobbler' is the most widely adapted early variety and 'Katahdin' the most widely adapted late, but other varieties are often preferred. In the Great Plains, 'Triumph' is preferred for summer use and 'Katahdin' and 'Rural' for winter. In the Pacific Northwest, 'Russet Burbank' (Netted Gem), 'White Rose,' 'Katah-

din,' and 'Sebago' might be recommended for the late crop.

"In the South, where one crop is planted in early spring and another about midsummer, varieties are very important. 'Irish Cobbler' and 'Triumph' have been standard for the spring crop for many years, but they are being replaced in some sections by new varieties. In home gardens 'Red Warba,' 'Warba,' 'Katahdin,' 'Chippewa,' and 'Sebago' often outyield standard varieties. For best results, three varieties might be grown: 'Red Warba,' very early; 'Chippewa,' intermediate; and 'Katahdin,' late. They should be planted as early as possible. For midsummer planting 'Irish Cobbler' and 'Dakota Red' give fair results, but often 'Katahdin,' 'Sebago,' 'Sequoia,' and 'Pontiac,' a late red-tuber variety, give higher yield and better quality. Spring-crop tubers for storage should not be harvested until the plants mature. They should be handled carefully and not stored permanently until a firm skin develops."

'Kennebec' is a new blight-resistant variety of rapidly increasing importance, chiefly in the Northern States. It merits widespread trial there and in bordering districts.

Squash. The numerous bush summer squashes are well known, widely adapted, and generally satisfactory for the purposes for which they are grown. Little needs to be said here about them, except to call attention to F_1 hybrids and F_2 stocks that have become available in recent years. 'Hybrid Cocozelle,' 'Zucchini Hybrid,' and 'Seneca Prolific Hybrid' are three new F_1's of commercial origin which resemble their parent varieties, 'Cocozelle,' 'Zucchini,' and 'Early Yellow Prolific,' respectively. Greater earliness, yield, and uniformity are claimed for the hybrids. Seed costs two to three times as much as that of open-pollinated varieties.

A bush type pumpkin called 'Cheyenne Bush' produces small fruits somewhat similar to those of Small Sugar. It is early and adapted to the Plains.

Vining squashes generally require more space than can be spared for them in small gardens. Of the many good varieties, a few will be mentioned here because of specific qualities. Where there is room for vining squash, the early little 'Table Queen' has long been a favorite. More recently 'Butternut' has become popular, a small, short, thick-necked squash with a swollen blossom end. 'Butternut' is used in the same way as 'Table Queen,' and is of high quality. 'Buttercup,' an older variety, is a small Turban type that was developed for earliness and adaptability to the Plains. Its flesh is high in solids, richly orange colored and surprisingly similar to sweetpotato when cooked.

In the South and other areas where insect pests are especially troublesome on squash, 'Alagold' or 'Improved African Squash' has been reported to have real advantages because of its insect resistance. It is sometimes classified as a pumpkin rather than a squash. 'Table Queen' and 'Butternut' are fair keepers, and 'Buttercup' and 'Alagold' have excellent storage qualities.

The squashes with the richest flesh are 'Golden Delicious' and 'Boston Marrow,' two large, late kinds that are suitable for growing only in large gardens. Because of their susceptibility to insects and diseasees during their long growing period, they are none too well suited to the southern half of the country.

Spinach. Regardless of Junior's alleged antipathy for spinach, it continues to be a popular and important pot herb for both home and commercial production. It is definitely a cool-season crop.

The savoy type is generally most popular for home garden use with

'Bloomsdale Long Standing' and its strains best for spring planting and 'Virginia Savoy' for fall planting. The latter is mosaic ("blight") resistant, but it shoots to seed quickly when sown in the spring. The large flat-leaved type is more productive than the smaller savoyed varieties and grown mainly for processing. 'Giant Nobel,' 'Hollandia' (Prickly Winter), and improved strains of 'Viroflay' are all good. In general, the large flat varieties are a little more sensitive to extremes of climate or to adverse cultural conditions than are the savoyed varieties.

It is probable that new F_1 hybrids of spinach resistant to blue mold will be available commercially in the next few years. Experimental hybrids observed thus far are highly productive.

Sweetpotatoes. Sweetpotatoes are even less generally suited to the small garden than are Irish potatoes because the long trailing vines require much space. Furthermore, sweetpotatoes require a relatively warm long season, which largely excludes them from the most northerly states. They are being grown to an increasing extent in the warmer districts of Ontario in Canada which lie farther south and are warmer than many districts in the United States.

The favorite old sweetpotato variety in the South is 'Porto Rico,' a soft or "moist-fleshed" variety that is highly susceptible to wilt. It is being replaced to some extent by 'Allgold' and 'Goldrush,' two new wilt-resistant, orange-fleshed, soft varieties. For the small garden a short-vined strain of 'Porto Rico' called 'Cliett Bunch' should have merit where the 'Porto Rico' is adapted.

In the Middle and Northeastern States, the rather firm-fleshed or "dry" sweetpotato has long been predominant, but it is now yielding to the soft type. Of the firm or dry type, the 'Big Stem Jersey' and 'Yellow Jersey' are perhaps best known; the flesh of these is not highly colored. Mutations of the Jersey type having very deeply orange-colored flesh are now popular, among them 'Orlis,' 'Rols,' and 'Maryland Golden.' The last is giving way to 'Sunnyside' in the Chesapeake Bay area. 'Ranger' appears rather widely adapted.

Tomatoes. As a home garden crop the tomato doubtless ranks first in popularity. As an object of attention by the plant breeder it is well toward the top. Although some improvements have been made, little progress has been made in developing resistance in garden varieties to diseases other than fusarium wilt and verticillium wilt.

Several varieties now carry the high degree of fusarium wilt-resistance originally introduced in 'Pan America.' 'Southland' for the South and 'Homestead' for southern Florida carry it, as does 'Sunray,' an orange-yellow tomato, and 'Jefferson,' a scarlet-red one, for general culture. Two new varieties, 'Loran Blood' and 'VR Moscow,' that are highly resistant to verticillium wilt were introduced in 1953. Both are adapted to irrigated districts lying between the Rocky Mountains and the Sierra Nevada Mountains.

In the Southern Great Plains, the hot dry air of summer causes the blossoms of nearly all varieties to drop from the plants, resulting in little or no fruitfulness. The little plum-shaped 'Porter' variety is perhaps most tolerant to such conditions. 'Western Red' is a new one for that region. In the Northern Great Plains short season is added to the other adversities of the plains. 'Bounty' or 'Victor,' 'Sioux,' 'Firesteel,' and related sorts have been developed for such conditions. These are all relatively small fruited and bear over a short season. They are

not adapted to regions where the large-fruited varieties thrive.

One of the latest additions to the list of disease-resistant tomatoes is 'Manalucie,' developed in Florida. It is reported to have high resistance to fusarium wilt, leaf mold and gray leaf spot; and mild resistance to early blight, black spot, and certain races of root-knot nematode. Other varieties developed for multiple resistance to many diseases either have been unsatisfactory horticulturally or have shown little resistance to more than two diseases. 'Manalucie' will be watched with much interest.

F_1 hybrid tomatoes are slowly increasing in popularity. As with all other crops, hybridity as such does not insure superiority — there are good hybrids and poor hybrids. Many seed firms list two or more F_1 hybrids of their own production so that a large number of names is developing. These hybrids have not been tested as extensively as conventional varieties so that there is little basis for making recommendations for different regions. The limited availability of seed of individual hybrids also limits the value of any general recommendations. Until more experience has developed, the best recommendations for a hybrid are the reputations of the originator and of the seedsmen who offer it for sale. The hybrids should be tried generally, but on an experimental or test basis, like any new variety until known to be superior under a particular set of conditions.

A number of F_2 named stocks of tomato are also on the market now, sometimes under the erroneous designation of "hybrids," sometimes correctly as simply "F_2 tomatoes." By definition, a hybrid is the immediate result of a cross, not the generation following that cross. Some of the F_2 tomatoes are undoubtedly productive but, of course, are less uniform than true F_1 hybrids. This does not necessarily mean they have less value than certain hybrids, but they do have characteristics that are different from F_1 hybrids. F_2 seed is produced in the same way as that of a good stock of a conventional variety. Here again, as with the hybrids, experience with individual F_2 stocks is limited and supplies are limited compared with established conventional varieties, so that there is little basis for general recommendations.

'Rutgers' is still the most important variety in the eastern half of the country and 'Pearson' in California. There is little excuse for growing such unproductive and monstrous things as 'Ox heart' and 'Ponderosa.' Among the earlier sorts, 'Stokesdale' and 'Valiant' are popular and widely adapted but are wilt susceptible. 'Break O'Day' and 'Grothen Globe' (a selection from 'Break O'Day') are medium early and wilt resistant.

Muskmelons. Few readers may be interested in muskmelons because they require more space than is available in the small home garden. Furthermore, over most of the South and the East, attacks of downy mildew have become so serious that generally only poor yields and poor quality of muskmelons are obtained. In the Southwest powdery mildew is ruinous to most varieties.

Perhaps the best known of the new downy mildew resistant muskmelons is 'Texas Resistant No. 1,' since it is the oldest. 'Rio-Sweet' is also resistant and a little later than 'Texas Resistant No. 1.' Both these are somewhat resistant to powdery mildew. They are commercially available. At least one more downy mildew resistant kind will soon be available.

Where powdery mildew is a factor and downy mildew is not, 'Powdery Mildew Resistant No. 6' should be grown. This disease is especially seri-

ous in the Southwest. 'Powdery Mildew Resistant No. 45' is resistant to only one of the two known races of powdery mildew so can no longer be grown where Race 2 is present. It is, however, an excellent variety of Hale Best type that is otherwise widely adapted and of high quality. It is well worth consideration in districts where powdery mildew is not serious.

'Iroquois' and 'Delicious 51' are fusarium-resistant early varieties for the East and Northeast; 'Honey Dew' and 'Honey Ball' are somewhat resistant to fusarium, not well adapted to the more humid parts of the country but well adapted to less humid and irrigated areas. 'Honey Gold' and 'Farnorth' are two very early melons of Canadian origin.

The so-called winter muskmelons, including such varieties as the 'Casaba,' 'Crenshaw,' and 'Honey Dew,' are well adapted only to the less humid areas of the country. The winter melons also are late, requiring a longer and warmer season than is required by the cantaloup type. 'Hale Best,' 'Delicious,' and 'Honey Rock' are among the earliest varieties and recommended for the northernmost districts where muskmelons can be grown.

Watermelons. Because of high space and temperature requirements, watermelons are of even less general interest than muskmelons as a home garden crop. Some noteworthy new varieties, however, merit attention here.

Although small watermelon varieties have been commonly listed in American seed catalogs for many years, none of them attracted much attention until 'New Hampshire Midget' was introduced a few years ago. This tiny three to five pound melon has shot into prominence, relatively speaking, for a small melon, largely for two reasons: (1) its truly superior quality, and (2) the newly increased demand for small watermelons by single apartment dwellers and apartment-dwelling families of only two or three persons. The vines as well as the fruits are relatively small, bringing it within range of possibilities for home gardens of fair size but too small for large varieties. The variety is also very early.

A somewhat larger and later small early watermelon is 'Northern Sweet.' 'Coles Early' is a still larger (fifteen to twenty pounds) early variety for the North.

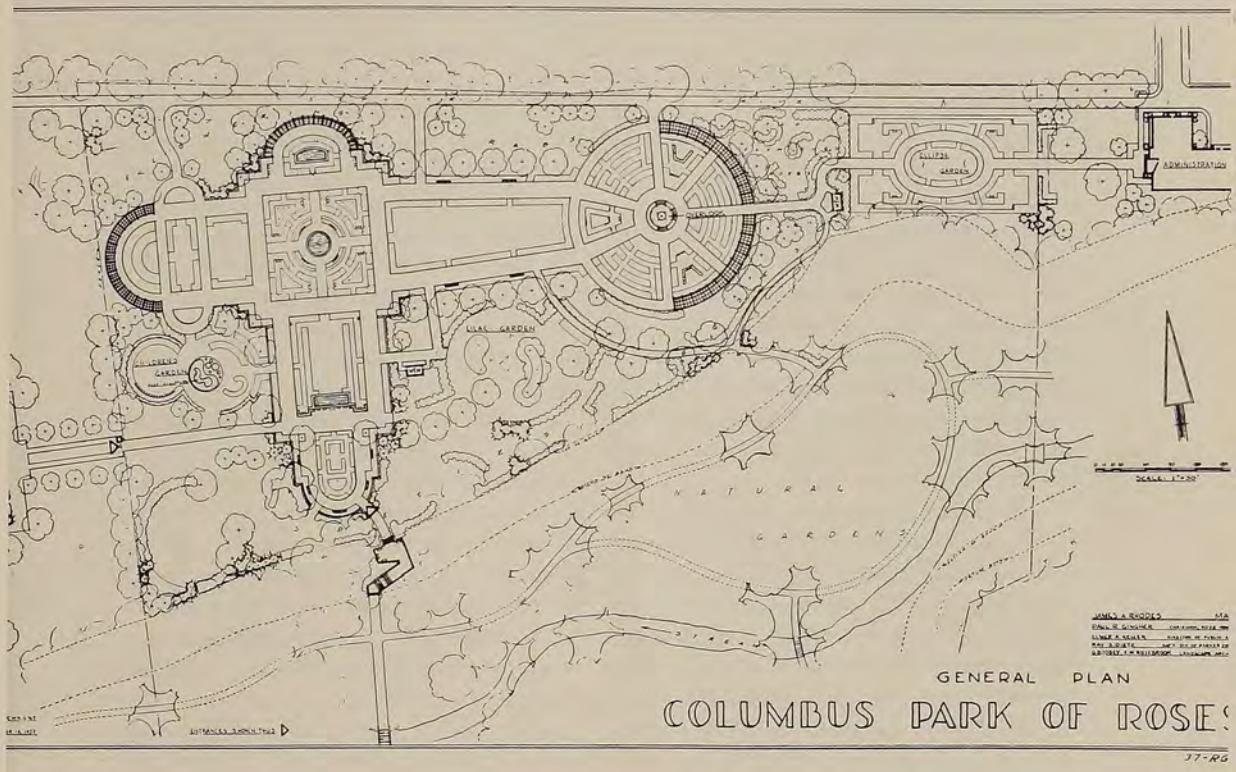
Two other new varieties, 'Congo' and 'Fairfax,' have proved highly important because of their resistance to anthracnose. 'Fairfax' is also resistant to fusarium wilt. These are long melons typically reaching thirty to forty pounds, not adapted to the more northerly districts. They bear over a longer season than other varieties chiefly because of their anthracnose resistance. Gardeners who can grow large melons should try them.

The watermelon varieties listed above are grown principally east of the the Mississippi River. In the West, 'Klondike' and 'Klondike R 7' are most popular. The latter is resistant to fusarium wilt.

The old 'Kleckley's Sweet' is of excellent quality when conditions are favorable, but it is susceptible to wilt and inclined to produce many "gourd-necks" in dry weather. 'Kleckley's No. 6' is wilt-resistant.

A Garden For America

RAY S. DIETZ [1]



The tremendous interest in gardening on a national scale has passed the status of being just a fad and is assuming the proportions of big business. The public interest which is sponsoring the re-birth of horticulture on the home front also places new demands on publicly supported park systems. It is now expected that a wide-awake park department will provide services of a horticultural nature such as: reliable information on local horticultural problems; demonstrations and lectures on practical gardening by public employees hired for horticultural work with the municipality; and the construction and maintenance of public gardens, where the people can see the newest and best along with the old reliable varieties from which they may choose what they wish for their own use.

The Park of Roses in Columbus, Ohio, was planned to fulfill all of these services to the public, with the accent on roses, and to have its influence extend to the limits of the United States instead of a purely local area. If present plans are completed as intended, this garden will be the largest public rose garden in America. It will include plantings of most of the successful modern roses available on the market, and

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several of the prominent collections of historical roses.

The best varieties of the Ray E. Shepherd collection of nationally recognized species roses are being propagated for use in a separate and distinct position in the gardens. Here the old-fashioned, the rare, and the unusual roses of yesterday will be brought together for perpetuation where they can be appreciated by all who are interested.

The Horvath collection of famous roses will also be segregated for display as a special interest attraction. Since a majority of these will be climbing varieties, it is intended that the collection will be located on an architectural feature of the gardens. When the roses reach maturity, it is expected that they will be given the publicity they deserve.

The basic design of the gardens of the Park of Roses is formal in nature with as much of the display space devoted to rose beds as is necessary, and yet with provision for easy access to all areas on wide walks. A study of the plan will convince you that, although the scheme is severe in layout, the scale is so large that there is no feeling of restriction in any part of the area. An excellent setting is provided by gradual changes in elevation from one garden to another and the existence of mature growth of natural woodlands and hedgerows completely surrounding the gardens. Additional plantings of trees and shrubs in the form of accents and background plantings have served to direct the long views toward the terminating architectural features, and to enclose individual portions of the gardens to advantage.

Construction of the gardens is still going on, with additional features planned for years to come, but the basic plan and the bulk of the rose plantings are now established. A discourse on construction methods and procedures would provide interesting reading, but would be too long for inclusion in this general article. Let it suffice to say that great emphasis was placed on all soil preparation and fertlity, and that water drainage and walks construction were thoroughly studied. A complete color plan for rose plantings was made prior to the planting season so that a harmonious result would be obtained in the use of over three hundred varieties of modern hybrid teas and floribundas. The use of tree roses as third-dimensional accents was included and even in their first year of blossom these plants stimulated great interest among the thousands of visitors.

In order to broaden the horticultural content of the gardens beyond the limits of roses and native trees and shrubs, it is anticipated that a lilac garden will be established in one of the meadows adjacent to the rose gardens. Approximately one hundred varieties of the highest rated French and domestic lilacs will be planted in informal groupings on the perimeter of this meadow area. Under-plantings of many types of ground covers and spring flowering bulbs will provide a double use and interest in this lilac garden area.

A collection of flowering crabapple trees of the most attractive forms and colors will be located on the northern border of the gardens to more heavily plant out the fence and the proposed residential area immediately outside of the fence. With these additions the Park of Roses will have an extended period of bloom beyond that included in the flowering season of roses.

Among the future developments included in present plans are two horticultural endeavors which are especially for the younger generation. A children's garden will be constructed where the emphasis will be placed on a com-

bination of horticultural training and recreation. Included in this garden will be a modern play-form in a small children's play area, surrounded by example plots of the better known combinations of annual and perennial flowers. Interesting trees and shrubs which have historic backgrounds or novel characteristics will be planted as named specimens for study and recognition. An out-of-door classroom area will be formed out of a combination of lawn and hedge plantings and will be available for public school use upon request.

The other development with emphasis on youth and conservation will be the maintenance of the splendid natural ravine which runs east and west throughout Whetstone Park in which the Park of Roses is located. Here it is possible to establish a series of winding nature trails among the woodlands and leading to various locations of wild flower groups, so that nature-study organizations and school classes can be encouraged to use this area as an out-of-door laboratory. If the demand is evident, a nature study specialist may be employed to organize and direct these activities as a part of the regular program. A test garden of considerable size and planting area is already designed, and soil preparation is complete. Test plants of new varieties among roses and perennials will be arranged in compatible groups for observation. Tests of different types of fertilizers, spray materials, mulches and forms of winter protection will be carried on as the demand for this information is made known. Propagators and commerical establishments who wish to participate in this test program are advised to communicate with garden officials of the Park of Roses.

The extent of the success of this venture in publicly sponsored horticulture remains to be seem. It is no longer a dream, but a hard-won reality, and the people who can make it a success by supporting it and demanding its continuance as a public function are the citizens of Columbus, the State of Ohio and all Americans who love beauty expressed in flowers and plants. You are cordially invited to include a trip to Columbus in your 1954 vacation plans, so that you may see for yourselves what is being accomplished in the name of municipal horticulture.

Antibiotics, Pesticides, and Food

Freeman A. Weiss

Recently there was widely circulated in our newspapers one of those perennial blasts against "chemicals in food" which sensational writers, serving as spokesmen for dietary and medical faddists, are wont to impress upon the the public. It attributed a large portion of the modern ailments of mankind, including those which more conservative diagnosticians attribute to various specific disease agents, to the alleged indiscriminate use of poisonous chemicals in food production, and of antibiotics in human and animal therapy. It stated that over seven hundred kinds of chemicals are being used in food production, over a third of which have not been proved safe.

Admittedly, any form of overindulgence may have evil consequences, even such "naturopathic" practices as sunbathing and sleeping in frigid rooms. The human animal is, however, essentially a chemical system; it exists on chemicals and by means of chemical transformations. It is impos-

sible to escape the impact of chemicals during life or even after death. Since many horticulturists are producers of food, in which chemicals are used in growing or processing, and all are users of food, the subject of chemicals in food is appropriate for mention in this column, however sketchily it must be treated. What is of most concern is that it should not be misrepresented to the public, either in unscientific claims or dogmatic denials, that the increasing use of chemical additives in food production does or does not constitute a major health hazard.

In this connection it is reassuring to note that this subject is receiving the attention of the best authorities in crop production, food processing, and health conservation. There is, first of all, the Food and Drug Administratiton which has the authority—and exercises it rigorously—to determine when any product for human consumption is not free from determinable health hazards. There is the National Research Council's Food and Nutrition Board, especially its Food Protection Committee, which conducts or supervises far-reaching research in this field. There are the numerous tasting panels—human guinea pigs—to determine by actual test, instead of suspicion and theorizing, what effects chemical additives and residues have on the flavor and wholesomeness of foods. There are annual symposia on this subject, such as that held by the American Association for the Advancement of Science, and the recent conference of newspaper food editors, in which all its aspects are thoroughly reviewed. Finally there is the consideration that the growers of crops and processors of food, and also the manufacturers of fertilizers, pesticides, and antibiotics, are consumers of food, and presumably have a personal interest in its wholesomeness. They have well organizied industries, too, directed by responsible leaders who are aware of the long term aspects of the chemicals-in-food question, and who demand answers that will stand up under all scrutiny. Surely, the subject is not being neglected!

To what extent are claims justified that "chemicals" are getting into our food? We use the term, not in the sense of natural components of food, all of which are chemicals of a sort, but as something artificially added or inadvertently introduced and not removed. We know, for example, that many commonly used food products, such as flour, cereals, bread, market milk, margarine, etc., are now enriched artificially in vitamin content. We know, too, that such chemical treatments have improved the quality of these foods in nutritional value, with the result that there has been a conspicuous decline in the incidence of certain deficiency diseases in a large segment of the population. The results have generally been too beneficial for any serious objection to have been raised against this sort of chemical alteration of food.

We are aware also that the use of antibiotics in other than pharmaceutical applications, especially in the feeding of farm livestock, has made great strides in very recent years. Here again, the benefits have almost altogether outweighed the doubts. Such remarkable gains in the health, the growth rate, and the economical use of feed have resulted from the addition of low concentrations of antibiotics (about one per cent of the customary therapeutic dosage) to the feed of poultry and swine, that the agricultural experiment stations now generally endorse the practice. At the low level of antibiotic administration for growth stimulation no detectable residue can be found in the meat, and even the residues from the much higher thera-

peutic levels are destroyed in cooking. There is, admittedly, some question about the transference of antibiotics to the milk of treated animals, since milk is often used uncooked, but antibiotics are not used to any extent in dairy feeds as yet, except perhaps for calves. Their use in therapeutic doses for the treatment of certain diseases of cattle is not uncommon.

What have antibiotics to do with horticulture? Currently, very little, but some suggestive applications have been made and show future promise. A number of bacterial diseases of plants, which in general have been refractory to control by conventional sprays, have been shown to be susceptible to antibiotic therapy. Furthermore, some of the antibiotics have systemic effects, acting through the plant from local applications. The announcement last year that experiments had shown the possibility of preventing fire blight of apple trees by antibiotic foliage sprays, or even trunk applications, was so gratifying that speculation arose whether this might not be the means of restoring apple and pear orcharding to some of the southern and central regions of the country from which the hazard of fire blight had all but eliminated it.

Another suggestive use of antibiotics in horticulture is indicated by the striking improvement in the keeping quality of green vegetables, such as packaged spinach, resulting from preharvest sprays or postharvest dips with these materials. The effect is due to the prevention of bacterial rots. In similar though non-horticultural experiments, a marked improvement in the keeping quality of fish, shrimp, and other seafood has been obtained by packing the catch promptly in antibiotic treated ice. Reference has previously been made in this column to certain experiments indicating marked growth stimulation of plants that were grown in nutrient solutions to which minute quantities of antibiotics were added. Some claims of similar growth increases from soil applications have been made, but most experiments with soil applications of antibiotics have been disappointing because of the rapid breakdown and elimination of these materials from natural soils. In other applications antibiotics have been shown to have a useful role in the control of bacterial disturbances in industrial fermentations such as the malting of barley, the production of alcohol, and even the brewing of beer.

Those who are worried about the introduction of antibiotics in their food may take heart, however, from the cautious attitude of the Food and Drug Administration toward such use. It has thus far refused to sanction the direct use of any antibiotic in food for human consumption. Also to be noted is the policy of this Administration against the establishment of any tolerance for the organic pesticides, DDT and others, which have come into use in the last decade. Of all these materials, DDT is the only one that has been shown to persist unchanged and to accumulate in the soil for long periods. Mention has already been made of the rapid transformation of antibiotics, both in animal metabolism and in the soil.

We think it likely that the hazard of being overdosed with antibiotics is greater from the public's proneness to self-medication with them, or from their undiscriminating prescription by physicians, than from the food supply; and these sources, be it noted, are largely controllable by individual choice.

FRERES

A New Hybrid Magnolia

BERNARD HARKNESS

Magnolia × *Slavinii* (*M. salicifolia* × *Soulangeana*) hybr. nova.[1] (*M. stellata* × ?) E. Keiper, *Journal, New York Botanical Garden,* Vol. 48, (576), p. 279, Dec. 1947.

From the anise-leaved magnolia, *Magnolia salicifolia*, there have been recorded two other hybrids: *M. Proctoriana* described by Alfred Rehder for the *salicifolia* × *stellata* cross and *M. kewensis* named at Kew Garden for a *Kobus* × *salicifolia* cross. It is the firm belief of Mr. Bernard H. Slavin, who has watched the subject plant since its first flowering in 1917, that the seed parent, a plant of M. *salicifolia* in Highland Park, was fertilized by a nearby Soulange magnolia. Several numbered plants of this cross were preserved and have been propagated since. Herbarium specimens of *M. Proctoriana* from the Arnold Arboretum have been examined and, from their narrow petals and smaller leaves,

[1]Hybr. nova. inter parentes *M. salicifolia* (Sieb. & Zucc.) Maxim. × *M. Soulangeana*, Soul. Ramuli glabri; gemmae foliiferae villosae vel glabrescentes. Folia oblonga, 5-13 cm. longa et 2.5-5 cm. lata. Flores praecoces; sepala 3, lanceolata 2-3 cm. longa, albida; petala 6-9, obovata, 8-9 cm. longa.

seem clearly to differ from the Rochester plants. No comparative study has been made of *M. kewensis*, also an uncontrolled cross.

The hybrid plant is a rapidly-growing small tree. Its branchlets are glabrous, dull green with red-purple spots sometimes completely coalescing to cover the upper surface. Its flowers in effect suggest *M. Soulangeana*. The petals number six, sometimes seven, and rarely nine, obovate in shape and rounded to acutish at the apex, 8-9 cm. long. They are white with a pink blush near the base deepening on the outside at the base of the central vein. There are three lanceolate sepals, 2-3 or rarely 4 cm. long, pale green in bud, quickly turning white. The deciduous outer bud sheath is dark brown, membraneous, netted with slight to considerable soft white pubescence sometimes at or near the base only. Flower buds are at or near the base only. Flower buds are densely pubescent and are carried on short stalks 4 mm. in diam-

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Flowers of Magnolia 'Slavins Snowy' April 1952

eter, also heavily pubescent. Stamens have pink midveins towards the tips and are suffused red-purple at their base. The seed coat is yellow becoming pinkish; seeds are suspended from an elongated green torus. Leaf buds, occasionally glabrous, are generally covered with appressed hairs.

The first warm spring weather brings Slavin magnolia to its flowering stage. In Rochester freezing weather often follows but in areas of more consistent spring weather or in situations where Star magnolia rarely suffers browning, this hybrid should be useful. As has been noted with other magnolia hybrids, it seems to reach flowering size more quickly and to flower more regularly thereafter than the species.

It is proposed to call the hybrid group *M.* × *Slavinii*, with BHS No. 85 selected as the clone, for which the cultivar name 'Slavins Snowy' has been chosen. The full name of this selection is therefore *M.* × *Slavinii* 'Slavins Snowy.'

This magnolia is named in honor of Bernard H. Slavin, during whose long association with the Rochester Parks, this and many other hybrids and seedling variations were selected and preserved by him. Recognition of his work has been accorded in the naming of *Cornus Slavinii* Rehd., *Crataegus Slavinii* Sarg., *Pinus Mugo* f. *Slavinii* Hornibr. and *Robinia Slavinii* Rehd.

The Peony

E. Buckner Kirk

On a rough mountainside in prehistoric Greece, a shepherd sat one night keeping watch over his flock of scrawny beasts. Staring vacantly around him, his eye was caught by a trick of moonlight—its sheen on the dew-drenched petals of a nearby clump of peonies. Cause and effect as we know them, based on observation and experiment, were concepts for the far future. The dim slow brain that received that sensory impression marveled. Here was a familiar flower that shone by night, that glowed in the dark! At the first opportunity the shepherd told his comrades of the wonder he had seen.

In some such fashion, down through the ages that predate written records, from father to son, from tribe to tribe, went the word that the peony shone in the dark, that it must be of divine origin and possessed of most potent magic.

Quite possibly the first magic that the peony performed was to drive away devils and fears of devils from which the mountain shepherds suffered. Again a faulty chain of cause and effect operated. Peonies only "shone" at night when the moon was near the full, and the assaults of devils and fears of devils notoriously occur in darkness. But since the magic power to banish evil was associated with the peony, the flower received the credit and even its proximity on a dark night must have brought comfort to many a fearful man.

The next step may well have been to reason that, if this flower was so potent against devils and evil spirits where it grew in the ground, a piece of the plant worn on the person might be equally potent to preserve the wearer from devils and evil spirits wherever he might be.

The magic of primitive man, anthropology has now shown us, was not mere superstition and mumbo-jumbo, but a legitimate science. However childish the reasoning may seem to us now, our remote ancestors had soberly

worked out methods for influencing transcendental powers with which they could not otherwise cope. Not for a moment do I mean that modern man has solved the problem of understanding and influencing the transcendental —it is still high and far for us to seek, but its boundaries are different. We have found physical laws that bring such things as most illness, many menmice. An Egyptologist has told of finding in the stomachs of little children who died nearly six thousand years ago the remains of mice that had been eaten by these children just before they died. Mice, the Egyptians had observed, crawled out of the cracks of the mud left by the inundations of the Nile. Mice, they reasoned, were spontaneously generated by the mud and therefore

"The Duke of Lancaster Dines With The King of Portugal." Detail from an illustrated Manuscript, 1387.

tal aberrations and even some aspects of the weather under man's control. Evil spirits and demons, who can be placated with animal or herbal offerings, no longer are believed to be the primary cause of disease and insanity, earthquake, and famine.

The most vivid description I have read of the way in which magic operated as the science of primitive man is concerned not with flowers but with must contain the very essence of the life-giving virtue of the river itself. If then a child was ill, what better remedy could be prescribed than a mouse?

By the same sort of reasoning a flower that shone in the dark must have great and supernatural power. Legends and myths cling naturally to a magic flower. A plant of such immense potency was no common thing to be pulled up casually by anyone who happened

to want or need it. It had to be dug at night for, should a man attempt to do so by day, he risked the loss of his eyes by the woodpecker who guarded the magic herb. Theophrastus (370-287 B.C.), "the father of botany," who was among those extraordinary Greeks who tried to base their knowledge of natural phenomena on facts, characterized this fear of the woodpecker as "far-fetched and irrelevant." One wonders if his comment would have been so temperate had he known of the elaborations that time was to add to the digging of peony roots. Gerard cites two authors from Roman times who illustrate these elaborations. Josephus (circa 37-95 A.D.) thought that those who wanted to gather the plant could do so safely only after they had poured a woman's urine or menses upon it. Ælianus (circa 220 A.D.) claimed that even under cover of darkness it was dangerous for a man to dig peony root. As in the case of the mandrake, a hungry dog must be tied to the plant with roasted meat set near by so that the dog would drag the peony from the ground in his effort to reach the food.

These legends lend color to Pliny's remark that "the paeonia is the most ancient of them all." And he goes on to say that it still bears the name of him who was first to discover it.

As usual, accuracy was not Pliny's forte for, according to Greek mythology, Paeon did not discover the peony but was given the potent herb by Leto, the mother of Apollo. It was traditionally with the peony that Paeon healed Pluto of the wound he received during the Trojan War from a "swift shaft" sped by Hercules. Presumably peony was also among the herbs with which he made a plaster for Ares when the doughty god of war sat whimpering beside Zeus after his flight from Troy where he, too, had been wounded. These successes so aroused the jealousy of Æsculapius, whose pupil Paeon had been, that Æsculapius plotted to kill him. (Probably, as Mrs. Harding remarks in her invaluable book on the peony, the first recorded instance of professional jealousy.) Pluto was so grateful to Paeon for healing him that he spared his doctor the usual fate of mortals by changing him into the flower that bears his name.

Magical attributes, myths and legends are all that we might expect to find about the peony in the remote past, so it is at once surprising and delightful to run across peonies in ancient history. It is a tenuous enough reference, heaven knows, but I for one was charmed to discover that there was once a country — a separate national entity with a king, a government, and an army — called Paeonia. Whether the land was named for the native flower or the flower took its name from the land we do not know—probably never shall.

There is a tradition that in pre-Homeric times descendants of the ancient Phrygians of Asia Minor, from the neighborhood of Troy, migrated in great numbers to Europe. They settled north of what is now Greece and, at the height of their power, controlled a crescent-shaped area reaching up from the Aegean on the east, and including the seaboard covering the mouth of the Struma river, through a bit of modern Bulgaria, along northern Greece to that western corner where, in the neighborhood of four lakes, Greece, Albania, and Yugoslavia now meet.

Homer speaks of Paeonians "with curving bows" from the Axius (Vardar) who fought on the side of their Trojan kinsmen.

Later, during the Persian wars, much of Paeonia was conquered. Herod-

otus tells how Darius (circa 521 B.C.) disposed of whole tribes of Paeonians by mass migration. Resting in Lydia (now Turkey) after a campaign, he was intrigued by a woman he saw. Not only was she beautiful, but her industry delighted him. She was walking along leading a horse to water, a pitcher on her head, and spinning flax with her free hand. On learning that she was a Paeonian he immediately sent word to his military commander in Thrace to conquer these hard-working people and deport them straightway to Asia.

The part of Paeonia that escaped the Persian inroads was to the west. There in mountainous country, dotted with lakes, where peonies flourish, a fiercely independent group of tribes made their homes. These, according to Herodotus, were built on platforms in the middle of the lakes and parents "tied their baby children by the foot with a string to keep them from rolling into the water." A trap door in the floor of every house offered access to an inexhaustible supply of food in the form of the fish below.

Paeonia was conquered eventually by Philip of Macedonia and thereafter such history as it has had was that of a province, not an independent state. But it is fun to know something about a land and a people who proudly bore the name of a flower we cherish. It is possible that the ancient Persians named a city for the lily, but Paeonia is the only nation of which I have ever heard that bears the name of a flower.

It may seem a far cry from a prehistoric shepherd's simple wonder at a moonlit peony to the teething necklace of a nineteenth century baby, but the extraordinary fact remains that a traceable thread runs back through the medical history of the peony to the magic that was primitive man's science. Because of the persistence of that magical aspect of the peony, its medical history is far and away the most interesting of any flower that I have studied and the most amazingly consistent.

Plenty of plants have been credited with the same "vertues" over centuries, but usually the reason they were so credited is unclear or has been wholly lost to us. And, in addition to that, in the course of time, the original virtue accorded one flower will be confused with some other flower—as in the case of the cornflower and the centaury or, over a long period of time, the original value of a plant would be lost sight of in newer values attributed to it by a later age. The more herbals one reads the more confused the picture becomes: —a flower that one has pinned down in antiquity as a specific for, say, respiratory troubles, may turn up in the sixteenth or seventeenth century as a sure cure for the itch.

The peony, of course, was no exception to the rule that a plant valuable for one ailment might well serve for others. In the course of its long medical career it has been used in childbirth and for female complaints (practically every herb seems to have been tried out for these at one time or another), stomach ache, kidney troubles, fevers, sciatica, gout, dropsy, headache and various other maladies. But along with prescriptions to combat these ills has gone, in practically all the old medicine I have read, the assurance that peony root or seeds would be effectual in coping with epilepsy and such "related" illnesses as convulsions and "the Incubus we call the Mare" as William Cole described another malady, — or to put it in the words of a more modern physician "that disagreeable disease, the nightmare."

More than seventeen hundred years before Dr. Meyrick, in his *New Family*

Herbal (1790), referred to nightmare as a disagreeable disease, Pliny wrote that peony "is a preservative against illusions practised by the Fauni in sleep."

Pliny, as the bibliographies at the ends of his books indicate, based much of his information on ancient Greek herbals now lost and these herbals had evolved, as all herbals have evolved, from the folk medicine of an earlier time. Ancient folk medicine was based on the only science primitive man knew — magic. So we find in Pliny's writing, as well as in that of his contemporary, Dioscorides, material, now undocumented, that can be traced back, at least by logical deduction, to a folk medicine of undeterminable antiquity.

Pliny's "Fauni" were the Roman version of more ancient Greek devils and evil spirits. Even Dioscorides, whose herbal is singularly free of magic, devotes his last words on the peony to remarks about its potency against "bewitchings and fears and devils and their assaults. . . And it is said that sometimes, growing on an hill where there were devils, it drove them away."

There was only a single short step to take from devils and evil spirits that objectively "assault" a man to the subjective "possession" of a person by devils and evil spirits. Surely nothing less than a demon could be responsible for the horrifying writhings and rackings of the human body in epilepsy or convulsions; nothing less than a devil could drive an otherwise courageous man out of his bed, sweating with terror.

Once that step was taken, the peony offered an obvious remedy. Had it not been held from time immemorial as powerful against evil spirits and the terror by night?

We do not know exactly when that step was taken, but it must have been early because Galen, writing in the second century of our era, speaks as if the peony had long been used for epilepsy. "I do not entirely relinquish the hope," he wrote, "that it may have been reasonable to rely on it (the peony) to cure epilepsy in children, even if used as an amulet." It would appear that one of the greatest doctors of all time falls back on magic as lesser men were to do for centuries to come, but we cannot be dogmatic about it. Galen had done some experimenting with peonies for epilepsy in an entirely rational fashion and the word "amulet" in his time did not carry quite the same magical connotation it has today. But that last phrase, *even if used as an amulet,* does suggest a reservation in Galen's mind. Magic or medicine, he used peonies for epilepsy and we can feel sure at least that it comforted him as a doctor to have a specific he could recommend. In that respect he was more fortunate than are his modern prototypes.

One voice in ancient medicine, however, was silent on the use of the peony for epilepsy—the greatest voice of all, that of Hippocrates. While the father of medicine was silent about the peony as a specific for epilepsy, he was by no means silent about the illness itself. He wrote a whole treatise upon "The Sacred Disease" in which, at that time, he based his discussion upon the staggering assumption that there were no such things as "sacred" diseases, i.e., diseases that came from the gods. All disease, he held, was a condition that could be explained as soon as men had accumulated enough knowledge — epilepsy along with the rest. "It is not, in my opinion," he wrote some time in the fifth century B.C., "any more divine or sacred than other diseases, but has a natural cause, and its supposed divine origin is due to men's inexperience and to their wonder at its peculiar charac-

ter."

That is a simple sentence which any modern reader can accept as an obvious statement of fact. At the time it was written it was just as obviously far too radical to be believed. And the point of view it expressed was based on reason that repudiated not only the divinity of the disease but also the charlatans and witch-doctors who claimed to cure it with purifications and magic spells. The early Greek herbalists probably recoiled in horror from this sacrilegious point of view. The Arabian doctors of the great period of Arab medicine knew their Hippocrates well, but they bypassed this dangerous idea as their addiction to amulets and magic charms bears ample witness. Mediaeval physicians ignored it because the Christian church held that men could be possessed by devils—and when more obviously than in the seizures of epilepsy?

When the invention of printing made ancient classics available to many men, some must have read Hippocrates with wonder and delight—a fearful kind of delight, because his rational and empiric doctrine was as much at variance with the teachings of the Christian church as it had been with the old faith in the gods of Olympus. Only after the Reformation had freed men's minds so that they dared to experiment for themselves and draw their individual conclusions did the Hippocratic doctrines come into their own. They came with such impact that they were accepted uncritically, the faulty ideas about "humors" and venesection along with the great thinking that makes them still wonderful to read in the twentieth century.

So it is possible to pass from classical medicine to that of the Dark and Middle Ages without being surprised to find that the peony continued its career as a cure for epilepsy—sometimes in straight magical fashion as an amulet, sometimes as a drug administered internally.

It is probable that peonies had not reached England by the tenth century, for I found none in the Anglo-Saxon leech books that I have read except in those that are translations from Dioscorides and Apuleius. In those, of course, peonies appeared along with the numerous other Mediterranean and south European plants that posed such riddles to northern students in those early innocent days. But by 1161 Macer's herbal could specify that five "greynes of pionye" added to vervaine (another magic herb) and gathered with *pater nosters* and *aves,* would, after the patient had been cleansed "owt of dedly syne," cure him of the falling sickness.

Saints in medieval times were patrons of various diseases and, while a number of them presided over epilepsy, the most interesting patrons were not saints, but the three wise men who, "when they were come into the house, they saw the young child with Mary his mother, and fell down and worshipped him." As Dr. Temkin points out in his fine book *The Falling Sickness,* it was probably because they *fell down* that they came to be associated with epilepsy. At any rate they, together with the peony, figure in a prescription written about 1412 by John of Ardene: "Against Epilepsy write these three names with blood taken from the auricular (little finger) of the patient, — Jasper—Melchior—Balthazar, and put gold, frankincense and myrrh into a box. Let the patient say three *pater nosters* and III *Ave Marias* daily for the souls of the fathers and mothers of those three kings for a month and let the patient drink for a month of the juice of peony with beer or wine . . . and without doubt this remedy never fails." The type of magic had changed, but it was still magic. Certainly it can-

not be called medicine.

With the Reformation such mumbo-jumbo ceased, but the peony remained and, with more old source books in circulation, there was a return to one of the peony's original uses. William Turner recommended fifteen black peony seeds for "the stranglyng of the night mare," and Gerard gives the "disease" a fine Greek name—Ephialtes. The latter also quotes Galen as his authority for using an amulet of peony for small children, but thinks that those that "are growne up in more yeares" should be given peony root internally. Parkinson thought it valuable for all "Epilepticall diseases" and that the root hung "about the neckes of the younger sort that troubled therewith" might serve as a preventive. Here is still magic mixed now with a tendency to use a drug in what we would think of as more orthodox medical fashion.

By the seventeenth century, well educated doctors had had a chance to read, in whatever garbled versions, classical medicine, and Culpeper could say that peony had been found "by experience" to cure the falling sickness. William Cole also recommended it, and Burton, who naturally included epilepsy among his melancholies, stated that "piony doth help epilepsies." Even so great a doctor as Thomas Sydenham could include peony in a prescription for St. Vitus Dance—a new disease, to be sure, but with an association of ideas that is clear. However, by Sydenham's time, the first doubts had begun to creep in and there were arguments in medical circles as to whether or not the efficacy of the peony was anything like so great as the claims that had been made for it. At long last modern science was beginning to take a hand—tentative at first, but firm later on. The popular idea, however, in the magic value of the peony had not, as we shall see, by any means disappeared.

For it was in the latter part of the seventeenth century and the early eighteenth that the "Anodyne Necklace" came into its own. Some time in the late fourth or early fifth centuries Oribasius had recommended that epileptics, teething children and pregnant women wear necklaces of beads made from peony roots. No doubt these had had local popularity here and there through all that time, but it remained for the flamboyant quacks of the Restoration and the following years to seize this "cure." "Miraculous necklaces"—thus runs an early eighteenth century handbill—"for children breeding teeth, preventing (by God's assistance) fearers, convulsions, ruptures, chincough, ricketts and such attendant distempers." The prehistoric and medieval ideas of preventive magic had raised their heads once more, even in the face of the growing body of empiric knowledge that was being accumulated by men with scientific minds.

As late as the nineteenth century, faith in the age-old belief in the value of the peony for epilepsy still hung on here and there, but there is an indication of the new scientific caution in Dr. Thornton's quotation (1810) of a Scottish doctor who reported that he had dosed two epileptics with peony root and claimed "that one of them received a temporary advantage from its use." That damning with faint praise may well have been the swan song of the peony in medicine.

But its magic power was still potent in the minds of simple people. Necklaces made of beads of turned peony root were hung about the necks of babies until the closing years of the last century. Latterly, of course, they were no more than teething rings. Science had spoken and their value as preventive magic was gone. Gone except, one can feel quite sure, that here and there a grandmother clasped the beads about

a baby's neck with a vague memory of their protective power that she had learned from her own grandmother. Dimly remembered magic or teething rings, their descent held true from prehistoric Greece to the modern world.

Precisely the same sort of thinking that kept the peony in medicine as a remedy for epilepsy for so many centuries sent it into the still-room books. There it continued in the prescriptions for epilepsy, but was to be found still oftener in the many remedies suggested for a "related" and commoner ailment —convulsions.

Toward the beginning of this century an interesting volume was found in the library of a distinguished collector. It was a folio, bound in green, its pages of vellum and its text in manuscript in the handwriting of several different people. Experts say the writing covers a period of about fifty years, from the beginning to the middle of the eighteenth century, but we do not know the name of the family to whom this book belonged. Some unknown lady of the manor must have started it with pride as she wrote out her prescriptions and recipes on the fine vellum. Her daughter or daughter-in-law took over where she left off, no doubt, and then perhaps a member of the third generation filled in the rest of the pages. Under the title, *A Book of Simples,* this anonymous volume was published in 1908 and should serve as a fair sample of all those still-room books that were treasured in every castle, manor and house of substance in the days when great ladies were expected to oversee not only the brewing, the baking, and the candlestick making, but activities which are now delegated to a whole series of specialists—laundries, dry-cleaners, exterminators, veterinarians, nurses and doctors. The burden of medical responsibility they carried staggers us today. They were expected to be able to cope, at a moment's notice, with the treatment of illnesses and accidents that would send a modern woman straight to the telephone to summon an ambulance.

As one reads *A Book of Simples,* the still-room itself — hitherto only a phrase to me—takes on form and substance. To begin with, it involves one of those characteristic English abbreviations that has now become set in the language, for "still-room" was originally, of course, the distillery room. In it were kept and used those clumsy alembecs and bain-maries that were the great-grandparents of our modern laboratory equipment. With these not only perfumes and cosmetic waters were distilled, but also many medicinal preparations as well.

On a busy summer morning in the still-room every possible vessel would be pressed into service to distil rose-water, on which the lady of the manor kept a sharp eye as she measured out ingredients necessary for the day's work or, perhaps, rubbed a piece of saffron to a powder in a very small marble mortar. In the open doorway two little girls sat on the sill pulling the petals from the roses in a great basket set on the ground below them and cutting off the white "nails" of the petals to leave only the red or pink parts for distilling. Behind them, and across the room in front of the open fire, their mother, the chief still-room maid, sat slitting earth worms and keeping an eye on the snails roasting in the embers —both worms and snails important to the efficacy of a cure for jaundice "or Collick in the Stomach." At a big table near the middle of the room, one maid was reducing whole cloves to powder in a mortar, a chore that seemed to her child's play in compari-

son to the jet she had had to pulverize the day before. At the other end of the table, a third maid rolled pills on a marble slab — pills designed to overcome "Vapours of Spleen & Fits of ye Mother" provided they were taken "when you find the fits comeing" and again at bedtime with "a little hysterical water." A vast array of odors rose from the crocks and earthenware jars in which various herbs, minerals, and such animal matter as crab claws, harts horn, and ivory shavings were steeping in oil, wine, or vinegar as the case might be.

That is a purely imaginary picture of still-room activities designed, however, to point up the substances handled there and the equipment used. But an important part of the still-room remains to be mentioned — the locked cupboard.

The still-room book of the seventeenth century Countess of Kent, Elizabeth Gray, opens with a prescription for epilepsy: — "A medicine for the Falling Sickness. Take a pennyweight of the pouder of Gold, 6 pennyweight of Pearl, 6 pennyweight of Amber, 6 pennyweight of Corral, 8 grains of Bezar, half an ounce of Piony seeds: also you must put some pouder of a dead man's skull, that hath been an Anatomy, for a woman, and the pouder of a woman's for a man, compound all these together; and take as much of the pouder of all these as will lie upon two pence for 9 mornings together in Endive - Water, and drink a good draught of Endive-water after it." Now, except for the peony seeds, every item in this prescription must have come from the locked cupboard—powdered gold, pearl, amber and coral, not to mention bezoar and the "pouder" of human skulls, and were not substances to leave lying casually around a room where ignorant and underpaid servants might help themselves. The locked cupboard was an important part of any still-room and one wafts toward it the probably vain hope that it contained not only the rare and expensive drugs but also such exceedingly dangerous ones as opium and aconite.

To return to our anonymous still-room book, it contains an especially large proportion of prescriptions for convulsions—so many, in fact, that one suspects this was a particular problem in the family to whom the book belonged. There are no less than five that take peony in some form or other, and several more besides made up without benefit of peonies. There is the "Hysterick Electuary the Lady Gerard's Rect." which includes "sirrop of pioneys" and which purports to have cured "both old and young of convulsions Hysterick vapours fitts and falling sickness." There is "A Very excellent Receipt against Convulsions which cur'd one had nine Fitts in a day" that also includes syrup of peonies among the ingredients, as does another "For Convulsion Fits." Dried peony roots, powdered, make a medicine to cope with "Very Stong Fitts or Fitts in Great People." Finally there is "The Convulsion Water" which takes green peony roots and is of such frantic complexity that one feels sure it was copied down by a desperate woman who had already tried everything and was at her wits' end.

That she was willing to try anything is witnessed by a revolting prescription which is as innocent of peonies as it is of punctuation or spelling. "Take three drops of cats blood in breast milk or cowes of the milk one spoonfull blood warm mingle the milk and blood together putting thereto a grain of musk and give it to the patient an hour before the fit if you know at what time it comes if not then as soon as they find it coming let them drink it. this is aproved."

Perhaps all families did not have such dire need for remedies for convulsions as had this unknown English family, but in the other still-room books I have read, similar prescriptions appear that used peonies consistently for both convulsions and epilepsy. So, throughout informal medical practice as well as through the formal, peonies held to the reputation that had been established for them when medicine and magic were one.

Peonies in the kitchen do not have so long a story as peonies in medicine but it is interesting to find that, while they seem to have begun their culinary career as a seasoning for poor men's food and drink, they reached dignity as the fare of kings.

Glutton, the personification of one of the seven deadly sins in *Piers the Plowman,* the fourteenth century poem by William Langland, starts out for church reeking with good intentions. But on the way he passes a tavern where Betty the "brewestere" hails him and enquires where he is bound.

"To holi cherche," quod he "forto here masse,
And sithen I wil be shryuen and synne namore."

Betty suggests that he try her good ale and he puts up a feeble resistance by demanding to know whether or not she has "any hote spices" to season the drink. Betty replies promptly and definitely:

"I haue peper and piones," quod she "and a pound of garlike,
A ferthyingworth of fenel-seed . . ."

Whereupon Glutton enters the inn as morally weak-kneed as he leaves it, physically, many hours later.

That the peony seeds served, along with garlic, fennel, and pepper to season the fare of the poor is made clear by the company Glutton finds when he enters the tavern: — Cecely, the shoeseller, Wat, the warrener and his wife, Tim, the tinker, with his two apprentices, Hick, a hackneyman, Hugh, a tailor, Clarice of Cock-lane who, judging by her address, was no better than she should be, a fiddler, a ditch-digger, a rat-catcher and various other contemporary working people, the list ending with a heap of upholsterers (vpholderes an hepe).

As a seasoning, peony seed would not have been as expensive as Betty's pepper that had made the long and hazardous journey from the Far East. But the roots of peony as a food could hardly have served as a staple for the common man. Only the very rich could afford such a delicacy as an exotic perennial of notoriously slow growth. So it is on the tables of kings, nobles, and prelates that we meet up with the peony served as a food.

When the Duke of Lancaster gave a banquet for Richard II in 1387, a hundred dozen peony roots were among the provisions laid in along with "the pigges and the maribones, the thousand egges and the Appelles." "Peionys" were served at the wedding breakfast of the Earl of Devonshire in 1389. "Pyionys" were one of the dishes in the third course at the coronation banquet of Henry IV in 1399 and "peiouns" appeared at the banquet given after his second marriage in 1404. "Pyions" were on the menu of the feast that celebrated the induction of John Stafford as bishop of Bath and Wells in 1425 and, at about the same date, "pyiouns" were mentioned among the dishes served at a banquet for one John Chaundeler.

We know that at Richard's feast the peonies were served "rosted" and perhaps with a sauce. At any rate, at a slightly later date we get a receipt for "A Sauce for peiouns.—Take percely,

oynouns, garleke, and salt and mynce smal the percely and the oynouns and grynde the garleke, and temper it with vynegre y-now: and mynce the rostid peiouns and cast the sauce thereon aboute and serue it forth."

Peonies appear in one of the dishes that may well serve as a sample of the lengths to which medieval cooking could go in the way of ingredients and time-consuming methods. "Mammenye Bastarde" dates from about 1430.

To make this dish one pound each of peony roots, raisins, saunders (powdered sandalwood), pepper and an unspecified amount of cinnamon were put over the fire in two gallons of wine or ale to which a "potelle" of clarified honey was added. Meantime, three pounds of almonds were set to steep in a gallon each of wine and vinegar, for how long the receipt does not say but presumably the length of time it would take the original pot to boil would suffice. The almonds were then strained out and the nut-flavored wine and vinegar added to the original mixture. Since Mammenye Bastarde was intended to be "styf," a modern cook is aghast at the thought of the length of time required to reduce these four gal-gallons of liquid, especially over an open fire. Eventually, however, that result must have been achieved and then, lest pepper (a pound, remember!), cinnamon, sandalwood, and honey fail to give the dish enough flavor, you "sesyn it uppe" with powdered ginger, salt, and saffron. It was served "alle flat on a dysshe, alle hote."

So far as my research has led me, the heydey of the peony in cooking seems to have been in the fourteenth and fifteenth centuries. But my knowledge of the matter is limited by time and eyesight. There are no cross references in old cook-books, even in those that boast indices. The only way to find out when, where, and how peonies, violets, pinks, marigolds and other garden flowers were used in early cooking is to read cook-books. I have tried to take fair samples of these at different periods, but I cannot pretend to have more than scratched the surface. The delightful and invaluable Whitney Collection in the Rare Book Room in the New York Public Library boasts over two hundred items. At the New York Academy of Medicine, of all places, is a collection of over six thousand! One quails at the thought of going on from there to other libraries in this country, not to mention those abroad.

As a postscript to peonies in cookery, I should add that I have tried them. I did not have the courage to make a Mammenye Bastarde but I "rosted" some roots along with a loin of pork. Now that I have made the experiment, I can easily see how peony roots can be turned into beads, good hard beads for a baby to cut teeth on. It is less easy to understand how the human stomach can cope with them. The taste is not too bad, acrid, not entirely unpleasant, but the texture is about what one would expect of a piece of young tree trunk roasted. The problem of mastication is so acute that one hardly notices the flavor.[1]

The rest of the story of peonies belongs to horticulture for I have not been able to find any evidence that they played any part in folk-lore after that of Greek mythology, nor did they appear in any of my reading on heraldry or cosmetics.

Even though Alexander Necham could list peonies among the adornments of a "noble garden" as early as 1157, there is little to show that peonies caught the imaginations of gar-

[1]The above section was reprinted from *The Bulletin of the Garden Club of America*, by permission of its Editor, Mrs. Winthrop H. Battles. (Vol. 42, No. 2, March 1954, pp. 31-33.)

deners until the 19th century, for Necham's garden, however noble, could only have been one of the two kinds of utilitarian gardens that flourished in the 12th century — the physic garden and the sacristan's garden, where that functionary grew flowers to decorate the church on feast days and holidays.

There are a few references to peonies in Tudor and 17th and 18th century gardens, but it was not until well after the oriental species began to reach Europe and England in the early 19th century that peonies as ornamental plants came into their own. In 1834, Maund's Botanic Garden tried to drum up some enthusiasm for peonies. "By the liberality of the London Horticultural Society many good collections of peonies are now distributed through the country; and when space will admit they should not be neglected. . . . We wish particularly to excite the attention of our readers to this genus of plants, from a conviction that, to many, who almost despise the old officinal Peony, a slight acquaintance with a few of the more esteemed sorts would open the way to augmented gratification."

To follow in the footsteps of Maund and venture onto horticultural ground, it does seem to me that we in America could afford ourselves greatly "augmented gratification" were we to pay more attention to the tree peonies.

When the travel book of a Russian adventurer, Nievhoff, was translated into English in the seventeenth century, his story about tree peonies was dismissed as a traveler's tall tale. But late in the following century, at the instigation of Sir Joseph Banks, specimens were actually shipped to England. They failed to thrive, as did the ones the great collector, Robert Fortune, sent over in the mid-nineteenth century. Since they come from the high mountains of the Chinese-Tibetan border where they grow under rugged conditions, it is not surprising that they have never taken kindly to the mildness of the English climate. We in America, on the other hand, have a number of areas where the rigors of their native habitat can be approximated. I know a New Hampshire garden where they have bloomed in splendor for sixty years, on Memorial Day, after winters when the thermometer often dropped to thirty and not infrequently to forty below zero.

When I reached this point, having told all I know about the peony, I sat staring out into space across my typewriter with a troubled conscience. Tree peonies are, according to Reginald Farrer, "par excellence the national flower of China," and herbaceous peonies are beloved only to a slightly lesser degree. The story of the part these flowers have played in Chinese medicine and diet, history and legend is beyond my reach, yet it cannot go unnoticed. But where to begin—and with what?

The "space" into which I stared is a wall covered with books, those particular shelves devoted to poetry. And there under—or rather over—my nose was a suggestion. Eunice Tietjens' anthology, *Poetry of the Orient,* Amy Lowell's and Florence Ayscough's *Fir-Flower Tablets,* Arthur Waley's *One Hundred and Seventy Chinese Poems* and Cranmer-Byng's *Lute of Jade*— surely one of these would offer a clue. No English or American poet I know has been moved to lyric expression by the peony, but I did seem to remember peonies in Chinese poetry.

I made a rich haul. I had been quite

right—there were often peonies in the poems, but best of all there were peonies tied by legend, history and romance to the golden age of Chinese poetry and to the most famous of Chinese love stories.

The tale concerns an emperor of the T'ang Dynasty (712-756 A.D.), who "was not a great ruler, but an artist stifled in ceremony and lost in statecraft. . . Poet and sportsman, mystic and man of this world, a great polo player, and the passionate lover of one beautiful woman whose ill-starred fate inspired Po Chu-i, the tenderest of all their singers, Ming Huang is more to literature than to history."

Yet history was turbulent in his time. We are sadly aware that the modern tragedy of China may surpass the ancient one, but Arthur Waley, writing in 1917, stated that Ming Huang's was the most tragic period in Chinese history. A rebellion broke out that culminated in a civil war that took thirty million Chinese lives. When the first flare-up came, the soldiers surrounding the Emperor refused to fight his battles unless they could execute the Lady Yang Kuei-Fei, his adored concubine, whose extravagances and follies they held responsible for the rebellion.

Yang Kuei-Fei had been called to the Emperor's attention at a time when the old gentleman "was inconsolable from the double deaths of his beloved Empress and his favorite mistress." The girl was young and lovely. Within a short time she became the most powerful individual in the Empire as even the kindly and gentle Po Chu-i realized, for he describes her as she comes from her bath:

". . . her girls attending, forth she came
A reed in motion and a rose in flame,
An empire passed into a maid's control
And with her eyes she won a monarch's soul."

When the crisis came and "the mutinous soldiers were thronging about the royal tent and clamouring for the blood of the favorite, it was the Emperor who sent her forth:

". . . . . lily pale,
Between tall avenues of spears, to die.
Policy, the bane of artists, demanded it, and so, for the sake of a thousand issues and a common front to a common foe, he placed the love of his life upon the altar of his patriotism, and went, a broken-hearted man, into the long exile."

Then legend is added to history in the tale of the Taoist magician who, at the Emperor's order, searched the Worlds for Yang Kuei-Fei and eventually found her in Paradise. An appointment was made and, over a bridge of light, Ming Huan journeyed to the moon where Yang Kuei-Fei awaited him under a great cassia tree surrounded by fairies. It was later arranged by the Ruler of Heaven that the lovers should be immortalized in the Tao Li Heaven.

If all this seems remote from the peony, that is not the case at all because this mixture of history and romance and legend is forever associated in the Chinese mind with peonies, thanks to one of the greatest, if not the greatest, of their poets. We can take our own leave of the peony in no more appropriate place than in this land where it has been loved and honored so long.

Cranmer-Byng sets the scene, this time of an incident that happened during the Feast of Peonies before tragedy overwhelmed the lovers, and the opening lines of a lyric by Li Po carry peonies forever into one of the great love stories of the world.

"In the city of Ch'ang-an, with its triple rows of glittering walls with their tall towers uprising at intervals, its seven royal palaces all girdled with gardens, its wonderful Yen tower nine

stories high, encased in marble, the drum towers and bell towers, the canals and lakes with their floating theatres, dwelt Ming Huang and T'ai-Chen (Yang Kuei-Fei). Within the royal park on the borders of the lake stood a little pavilion round whose balcony crept jasmine and magnolia branches scenting the air. Just underneath flamed a tangle of peonies in bloom, leaning down to the calm blue waters. Here in the evening the favourite reclined, watching the peonies vie with the sunset beyond. Here the Emperor sent his minister for Li Po, and here the great lyrist set her mortal beauty to glow from the scented, flower-haunted balustrade immortally through the twilights yet to come."

She is the flowering branch of the
peony,
Richly-laden with honey-dew.

Concerning Streptocarpus

PEGGIE SCHULZ

Streptocarpus is so beautiful the uninitiated are apt to believe that much care and skill is required to bring this member of the GESNERIACEAE Family into its full glory. Often called Cape Primrose, this African plant with its gayly-colored gloxinialike flowers and luxuriant foliage has long been a favorite with English gardeners. There are about eighty species and to make them easily distinguished gardening dictionaries divide them into three classes:

1. Stemless species with one prostrate leaf. The scapes of bell-like flowers arise from the midrib of this leaf.
2. Stemless species with several leaves.
3. Stem-bearing species with opposite leaves growing in rosette-like fashion.

According to botanical history, the species first introduced had blue or white flowers. In 1886 a species, *Streptocarpus Dunni*, which produced brick-red flowers, was used to pollinate the blue-flowered *S. Rexi*. Progenies of this union were "mauve-purple" and "bright rosy-crimson." These plants proved that it was entirely possible through careful selection to breed a more colorful race of streptocarpus. Since that time the hybrids have improved in color range and form to include flowers nearly as large as gloxinias with elegantly waved and frilled margins. Pure white, tints of blue and purple, pale pinks, bright reds, selfs, stripes, and contrasting throat colors—all are featured in the hybrids.

Foliage on streptocarpus is a handsome feature. The straplike leaves, many of which have ruffled margins, are lightly haired and show well-defined veining. When grown in a window garden or greenhouse, it is advisable to set large, older plants atop inverted pots so their luxuriant foliage is in no danger of being ruined. They make excellent hanging-basket plants for greenhouses or terraces.

Grow streptocarpus in a mixture of equal parts of light loam and leaf mold or any rich, porous mixture in which you have successfully grown other gesneriads. If you want to try your hand at growing these plants from seed, you will find them listed in many catalogues. Seeds are fine and should be sown atop chopped sphagnum moss, partially sterilized sand, or vermiculite. Some growers advise sowing the seeds right into the loamy growing mixture.

Seeds germinate in ten days to two weeks but some stragglers still come along as late as two months or more. With care you can expect these seedlings to flower in approximately a year from sowing time. Prick off and pot singly into two-inch pots when they have two good strong leaves, unless, of course, you are growing one of the monophyllous species. These must be potted when the single leaf appears strong enough to stand the change. Gradually repot streptocarpus until they are in four- or six-inch pots, according to their lodging space. While seedlings are growing, be sure they are kept moist and shaded from the bright sun. If you allow them to dry to the point of wilting, you are apt to have a batch of fatalities on your hands.

Greater success can be expected if you grow them in temperatures of fifty-five to sixty degrees. Since these temperatures are not comfortable for humans, do not expect top performance out of window-grown streptocarpus. You can, however, make the plants thrive and bloom if you place the pots atop pebble-filled trays or dishes. Add water to the pebbles but be sure its level is below the drainage hole in the pot. You can expect streptocarpus to produce two to four flowers at a time when grown in a northeast or east window. Some amazing results occur when you grow them in a cool basement fluorescent light set-up.

Fertilize these gesneriads biweekly (twice a month) with fish emulsion, weak manure tea, or a complete commercial fertilizer.

I like to treat streptocarpus as annuals or, at best, biennials. If you want to prolong the life of an older plant after it has reached the "shaggy" stage, however, do so by stripping off the heavy unattractive older leaves and splitting the plants into two or three parts. Repot into fresh soil and they are once more on their merry way.

Streptocarpus can be propagated through leaf cuttings rooted in water, sand, or any other preferred media. They are easily pollinated by removing pollen from one blossom and applying to the stigma of another. The long, twisted seed pods (from which they derive their name) are curious. Seeds ripen in about two months or less.

If you are already familiar with the gorgeous hybrids, you might like to add some species to your collection.

S. Dunni. This species generally produces but a single stemless leaf. But this leaf can grow to great proportions —three feet or more. The tubular flowers are brick red.

S. Kirki. Heart-shaped, stalked leaves and cymes of lilac flowers make this an interesting plant.

S. nobilis. Large purple flowers borne above four-inch ovate-cordate leaves are features of this West African species.

S. Rexi. Here is a little gem for the window garden or the greenhouse collection. A neat grower, it produces a rosette of four- to eight-inch long leaves. The one and one-half inch flowers in shades of near-white, blue, or mauve, are striped with a peculiar shade of brownish purple. The variety I have has blue flowers and is a year-round bloomer. It makes a delightful companion plant for saintpaulias and gloxinias. At one time this plant was named Didymocarpus Rexi and, though botanists discarded the name in 1828, it is still retained by some growers.

S. Wendlandi. This species produces but a single stemless leaf. The scapes of blue-purple flowers rise out of the midrib of the leaf.

A Book or Two

Lilacs For America. Edited by John C. Wister and committee. American Association of Botanical Gardens and Arboretums. 1953. 48 pages. $1.00, retail; 10 to 24 copies, $.80 each; 25 or more, $.60 per copy. (Published by the Arthur Hoyt Scott Horticultural Foundation, Swarthmore, Pennsylvania, and is available from that Foundation.) (Library).

Twelve years after the first edition, this, the second edition, appears. Completely rewritten, it includes some nine hundred names of lilacs now known, and sources where a majority of them are being grown in America. In attacking this tremendous problem, Dr. Wister was assisted by a committee of six, but he should be given the credit of doing all the work and making the tabulation himself.

Ninety-one correspondents went out to their various collections of lilacs situated all over the country, in the course of making this survey, and judged their plants as to color and beauty of flower, annual performance, type of bush, etc., resulting in a list entitled "Recommended Common Lilacs and Early Hybrids—100 varieties." To substantiate the selections for this list, the number of votes for each variety is given. For instance, there are nine single white lilacs and six double white lilacs in this select list. Some might suggest that this is too many, and it is—for the average home owner, but the idea back of this compilation was to list the varieties in the order of their current popularity.

It is of interest to note that twenty collections of lilacs are listed in America with forty-eight to five hundred and twenty-one varieties of lilacs actually growing at present. It is equally valuable to note that there are listed in this pamphlet, thirty-five nurseries offering twenty-six to over fifty varieties each (twenty of them offer twenty-five to fifty varieties). Also of great value is the lengthy list of varieties, in which the color, type of flower, origin, and American source, are given for each lilac that has been found to be growing now in America.

This work should give an added impetus to lilac growing, for here is all the information needed by the plantsman and, what is more, sources where he may see or buy the varieties he wants. This unique list can be a great asset to every modern plantsman in America.

Donald Wyman

The Concise Encyclopedia of Favorite Flowers. Compiled by Marjorie P. Johnson, and Edited by Montague Free. The American Garden Guild and Doubleday and Company, Inc., Garden City, New York. 1953. 256 pages, 10 color illustrations and 106 drawings. $3.95. (Library).

And it is just what the title states: a concise encyclopedia of (106) favorite flowers—and it is a compilation: of the uses, habit of growth, flowers, foliage, assets, faults, culture, diseases, etc., for each of the alphabetically arranged (of course) plant kinds. Although it does not contain a bibliography, one assumes from the time-honored information, that the compilation is not from original labor—but who cares whence M. Johnson "compiled" her data, they are very sound and expertly edited. It will be good reference for many a library. Katharine Burton is responsible for the wash drawings of the individual plants.

Christmas Idea Book. Dorothy Biddle and Dorothea Blom. M. Barrows and Company, Inc., New York. 1953. 221 pages. 120 black-and-white illustrations; 4 in color. $3.50. (Library).

Since the authors have suggested that Christmas preparations start months ahead, publishing in April a review of a book on Christmas decorations is truly the essence of preparedness!

This is a what-and-how-to-do-it practical book, the latest work of a mother and daughter writing team. In Part I, "Christmas in the Home," they give easy and inexpensive plans for decorating the doorway, hall, living and dining rooms, suggesting the use of three well-planned units of decoration —a common evergreen (or combination of two), a theme, and a color plan, all to heighten the atmosphere of hospitality. It lists necessary equipment and materials, and presents new ideas of making and trimming big and small trees.

The separate chapters on "Color: The Christmas Triad," "Decorating with Candles," and "Gift-Wrapping and Christmas Card Displays," deserve special mention.

Part II covers holiday programs and projects for garden clubs and communities, tours of houses decorated outside and in, and ideas for Christmas sales.

Between now and Christmas, think up a theme and decorating plan! From the vast number of excellent photographs and detailed instructions, you can produce a personal creation with a minimum of time and expense.

Margaret C. Lancaster

Easter Idea Book. Charlotte Adams. M. Barrows and Company, Inc., New York. 1954. $3.50.

A very helpful reference work for another season of the year—will be of great delight to the (Gardener's) housewife!

Western Fruit Gardening. Reid M. Brooks and Claron O. Hesse. University of California Press, Berkeley, California. 1953. 286 pages, 58 text illustrations and 48 chapter heading drawings. $4.50.

Doctors Brooks and Hesse have prepared an authoritative handbook for the home gardener on fruit varieties that can be successfully grown in the Western States. The authors divided their subject into three sections: 1) application of sound horticultural knowledge to the production of fruit plants—planning the garden; general care of the trees, pruning, propagation, etc.; 2) an A to Z listing of forty-eight varieties of fruit trees for this particular area with individual requirements for pruning, soil needs, etc., and recommended varieties; and 3) diseases and pests and their control.

Beverley Farmer is to be congratulated for the expertly executed line drawings which instantaneously relay the techniques of budding, pruning, etc. The format in toto is very pleasing. The authors are faculty members of the College of Agriculture and on the staff of the Experiment Station at the University of California at Davis.

Plants In Pots. William H. Clark. Little, Brown and Company, Boston, Massachusetts. 1953. 202 pages. Illustrated with line drawings. $2.95. (Library).

Elementary without being over simplified, comprehensive without being too technical, Mr. Clark's book tells how to satisfy the light, heat, water, food, and air requirements of a host of

common and unusual plants. He tells how to prepare soils and plant nutrients; how to select the best containers for the plants of your choice; how to insure proper drainage. How to prune, propagate and transplant, how to give protection from insects, etc., are all well taken under discussion. The last better-than-half of the book is an alphabetical arrangement of the more or less standard lot, and their specified requirements. Excellent.

Climate, Vegetation and Man. Leonard Hadlow. Philosophical Library, Inc., New York. 1953. 288 pages, illustrated. $4.75. (Library).

This book will be of interest beyond the field of horticulture for it deals with the principles that govern the climatic setting in which we live, the seasons, night and day, and the world distributions of temperature, rainfall and related climatic elements. If the reader has children of the age when the elements of world around us becomes a realization, it will be of considerable help in explaining the basis for our climate.

From the standpoint of pure reading pleasure, only those who have a good scientific background will be able to do more than absorb the basic facts, and the rest will have to be content with the recognition that the mysteries of sun, wind and rain which govern our plant life are established by rather precise science.

John L. Creech

Check List of Native and Naturalized Trees of the United States (Including Alaska). Elbert L. Little, Jr. United States Department of Agriculture, Forest Service, Washington, D. C. 1953. 472 pages. $2.00.

Dr. Little, under the direction of the U. S. Forest Service Tree and Range Plant Name Committee, (currently chairmanned by Dr. William A. Dayton, Chief, Divison of Dendrology and Range Forage Investigations), has done a splendid job of editing this, the Agriculture Handbook Number 41, which is the culmination of ten years' research and compilation. The introduction speaks well of the entire opus: "***aims to compile the accepted scientific names and current synonyms, approved common names and others in use, and range of the native and naturalized trees *** primarily a reference for foresters, botanists, students, and others interested in trees *** (but) is the official standard for tree names in the Forest Service." The reviewer is advised that the Check List was published in a very limited number so he suggests that you place your order for this monumental reference work with the Superintendent of Documents. Washington 25, D. C., immediately.

Wild Flowers of Western Pennsylvania And The Upper Ohio Basin. O. E. Jennings and Andrey Avinoff. University of Pittsburgh Press, Pittsburgh, Pennsylvania. 1953. Vol. I, 600 pages, flora by O. E. Jennings, with general introduction, numerous line maps and illustrations; Vol. II, with 200 color plates from watercolors by A. Avinoff. $60. the two volumes.

Two marvelously executed volumes which will come as both a perusal and a reference treat to anyone who finds enjoyment in the outdoors, no less than to the wild flower hobbyist and the botanist of our eastern flora.

Published by the Carnegie Institute, the University of Pittsburgh, and the Buhl Foundation of Pittsburgh, this

outstanding work of Dr. Jennings is essentially a flora of western Pennsylvania and adjacent regions of southwestern New York, eastern Ohio, northern West Virginia and western Maryland. It is based upon collections of the University of Pittsburgh Herbarium. The handiwork of the late Dr. Avinoff makes up the second volume in the form of two hundred magnificent life-size watercolor plates depicting two hundred and fifty-three wildflowers, and excellently reproduced by sheet-fed gravure. The subject for each water-color was selected as a living specimen by Dr. Jennings and each plate is accompanied by a helpful popular description of the plant portrayed. Sheet size is about 12 by 14 inches!

Besides full treatment of the flora by families and on more or less conventional lines, Volume I is prefaced by an excellent discussion of the geology, soils, physiography, topography, climate, and plant geography of this specialized region. There is also a bibliography and very useful gazetteer of collecting localities. Somewhat of an innovation are numerous small maps showing the distribution of selected species on a county basis.

In connection with these maps and considering the generous scale of their reproduction, one may wonder whether the location dots could not have indicated an actual collection area rather than being merely centered for each county; and in a work of this scope it will be normal for other botanists to find points of minor disagreement in occasional taxonomic interpretation as employed by the author or as quoted by him from the writings of others. But such occasional points are insignificant in comparison with the features that will demand ownership by all who can afford this flora which ranks among the finest that has ever been devoted to our native plants.

Henry T. Skinner

The Macmillan Wild Flower Book. Descriptive text by Clarence J. Hylander and illustrations by Edith Farrington Johnson. The Macmillan Company, New York. 1954. 480 pages, 232 full-color plates (of 426 wild flowers). $15.00.

The arrangement of alternating the text and the illustrations is interesting. Dr. Hylander's descriptions, etc., cover two pages (facing each other), then Mrs. Johnson's full page drawings. The book is a "panorama of the wild flowers with which nature so generously decorates the land" and it is very nicely done. The color work is an accurate portrayal of Mrs. Johnson's brush and a very faithful reproduction of the works of Nature. The nomenclature is that of the last edition of Gray's *Manual of Botany;* this is splendid in the majority of cases. Taxonomy of the plants is reviewed to help the reader or the searcher to accurately identify his specimens. By all means invest in this volume.

Vegetable and Flower Seed Production. L. R. Hawthorn and L. H. Pollard. The Blakiston Company, Inc., New York, 1953. 626 pages, illustrated. $7.50. (Library).

The authors, in the Horticultural Department of Utah State College, have brought together for the first time a most comprehensive array of information of interest to the vegetable seed producer. They not only describe the areas of production and the climatic and other factors responsible for the location, but they also discuss cultural practices, spacing depth, fertilization, irrigation, timing of planting, isolation, as well as many other steps in the growing of each of the seed crops. Attention is given to harvesting which in-

cludes season, methods, and yields. The breeding of each crop both as to accomplishments to date and future objectives is also discussed at length.

The book is divided into four main sections. The first treats the business of seed growing and gives much of its historical background both in this country and in Europe. The authors ascribe much of the impetus in American seed production to the two major wars which isolated the United States from the European sources of supply. Part I also discusses the environmental factors affecting the location of the industry in more general terms than those given for each of the specific crops.

Part II takes up each of the vegetable seed crops, treating them systematically, following a methodical pattern. Some simplification is attained by grouping the crops according to botanical families—UMBELLIFERAE, LILIACEAE, etc.

Part III extends the same comprehensive treatment to the flower seeds, both annuals and perennials. There has been much less research work in the production, breeding, etc., of flowers. The authors seem to have brought together all that is available, however, presenting first a general overall picture and then giving detailed descriptions by kinds of flowers.

Part IV discusses the harvesting and processing (milling) of the seeds, including an explanation of the functions of the more commonly used machines. Seed storage is fully treated—tempertures, periods, humidity, summarizing the data available. This section also contains a chapter "Handling and Marketing" which gives a brief picture of the relationship between the "contract" grower and the seedsman. Other phases are briefly outlined. The text, for it is both a text and a reference book, concludes with brief paragraphs on packaging seeds, treated seeds (for seed-borne diseases), coated seeds, and regulations under which the seed industry functions.

Because of the detail covered, the book is voluminous, but it is well written. The general reader is apt to consider the presentation as technical, but it is difficult to describe a plant otherwise, or to present a useful description of breeding without the use of technical terms. The other sections, including those discussing plant diseases and insect pests and their control, are certainly free of technical terminology.

The authors have freely cited the sources of information and at the end of each chapter list all such citations. This no doubt materially adds to the size of this book, but to the serious student it greatly increases its value.

W. H. Youngman

The Directory of American Horticulture for 1954. Edited by A. J. Irving. The American Horticultural Council, Inc., Ithaca. New York. 1953. 98 pages. $1.00. (Available from the publication office at 1 East 57th Street New York 22, New York.)

For the United States and Canada, Editor Irving has recorded the amateur and professional horticultural organizations—their officers, memberships, addresses, etc.; arboretums and botanical gardens; universities, colleges, etc., teaching horticulture; garden centers; state flowers and trees; All-American Selections trial grounds and judges for both flowers and vegetables; and a tremendous amount of other data that are absolutely vital to each and every person actively working in horticulture in any branch. This inauguration issue has as accurate an account of the existing data as was humanly possible to

gather AND we sincerely urge all those listed to keep the Council advised of changes in their organizations. The success of this invaluable reference work depends entirely upon you—not the AHC!

American Tomato Yearbook, 1953. John W. Cancross, Editor. Rutgers University, College of Agriculture. New Bruswick, New Jersey. 1953. 40 pages, illustrated. $2.00. (Available from the American Tomato Yearbook Business and Editorial Office, 8 Elm Street, Westfield, New Jersey.) (Library).

The 1953 yearbook brings together, and up-to-date, all data of interest on the varieties of Lycopersicum, that is to say, a revised listing of the associations actively interested in the improvements of the tomato industry; periodicals of interest (in which your *NHM* is not listed—but let us watch their 1954 edition after Boswell's splendid paper in this issue of our Journal!); the new directors of the agricultural experiment stations, to which the reader may inquire of his tomato problem; a very extensive bibliography, broken down by geographical range; etc., etc., in addition to many new general articles.

The Yearbooks of Agriculture: 1952, Insects; 1953, Plant Dieseases. U. S. Department of Agriculture, Washing, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C.) $2.50 each.

Time was when the Yearbooks of the Department of Agriculture were hardly considered literature at all, but merely statistical compilations with a few generalizations about the current state of various crops and agricultural products, of interest only to farmers and food processors. All this changed in 1936 when the statistical part of the Yearbooks was relegated to a separate publication, and the yearbook editors embarked upon a series of agricultural monographs that have proved to be not only comprehensive and authoritative guides to this most basic of our industries, but also works of real literary merit. A mere recital of some of the titles in this series testifies to the timeliness and broad scope of the subject matter in this progressive encyclopedia of agriculture: Climate, Soils, Plant and Animal Breeding, Human Nutrition, Trees, Grass.

The two most recent yearbooks, *Insects* and *Plant Diseases*, have a special appeal to horticulturists, and so are appropriate to mention in this review column. Mention is about all we can do, as the Insect volume contains 780 pages and has 72 color plates, the Plant Disease volume 940 pages and 32 color plates. Even a list of the titles of the numerous separate articles would require more space than is at our disposal. It must suffice to say that both volumes are the work of the foremost entomologists and plant pathologists in this country (the authors are not drawn from the Federal services exclusively, but include specialists from the State experiment stations and those in industrial and private employment). Readability and literary competence have been achieved by professional over-all editing. Almost everything, literally from A to Z, of contemporary importance in these branches of science and technology, receives some mention. The illustrations, especially those in color, are an outstanding feature. We have heard many favorable comments about these yearbooks from the horticultural lay public which is, in the long run, the most critical of reviewers.

Freeman A. Weiss

(Unless our Congress restores the annual appropriation item for this great Institution, one may consider Dr. Weiss' review of *Plant Disease* the obituary of the next to the last volume ever to be issued. Ed.)

Birds As Individuals. Len Howard. Doubleday and Company, Inc., New York. 1953. 216 pages, illustrated. $4.00. (Library).

It falls to the lot of few of us, who spend our every spare minute birding, to have a home so appropriately named as "Bird Cottage" from such intimate observations through the years as Len Howard has made and recorded in her incomparable British story. The pleasure and inspiration are unbounded and the scientific side of her stories of real value.

Miss Howard shows that personal approach, even to a pleasant countenance and happy voice, has been the secret in attracting birds to her cottage in Sussex which she claims is as much their abode as hers.

Observations of mating and nesting, sometimes chronolgically recorded, reveal marvels of fidelity, jealousy, arrogance, sheer indifference, and many other traits undreamed of in bird life. These nesting stories are entrancing and hold one's intense interest. The very minute and constant observations of her birds are revealed in a fascinating "family tree" of one line of her feathered friends returning each year for food, lodging, and nesting.

The author's naming of birds from their characteristics makes another delightful side to her story; their "games" and traits emphasize the reader's belief in bird minds, something this writer has firmly believed from her own observations. Many phases of bird life are given in this lively story; memory, intelligence, and parental "tutoring" of their young.

You cannot miss the chapters on bird songs, also minute in detail. Who but such an observer and bird lover as Len Howard could record in this volume the bars of music of many bird songs.

Mr. Eric Hosking, one of Britian's finest bird photographers, and of world note, has added charm and reality by so splendidly photographing birds in many characteristic poses.

Our own Roger Tory Peterson has given readers of this delightful volume a "Foreword" with wonderful descriptions of "Bird Cottage" and its owner, and in his characteristic way has so helpfully translated many of her birds into species most nearly our own, making the story of greater charm.

This writer considers *Birds As Individuals* the finest story of bird life in print today. Every bird lover, shut-in or active in the great out-of-doors, should read this volume with its many lovely stories of our feathered friends, —unbounded in interest from cover to cover!!!

Mary G. Van Meter

The Complete Book of Bulbs. F. F. Rockwell and Esther C. Grayson. American Garden Guild and Doubleday and Co., Inc., Garden City, New York. 1953. 352 pages, illustrated in color, halftones and diagrams. $5.95. (Library).

A modernized version of Rockwell's *The Book of Bulbs.* Covers most kinds of flowering "bulbs" from Achimenes to Zephyranthes, using the term in the popular sense of almost any storage organ except a seed that is planted dormant and produces a flower. Thus, by name, not only daffodils, tulips, crocuses, lilies, dahlias, gladiolus, and tuberous begonias are included, but also many "minor" bulbs—over a hundred

species in all—are discussed both botanically and horticulturally. Classified by culture, they range from hardy to tender; from spring-flowering through summer- and autumn-flowering, to bulbs for winter bloom indoors. The emphasis on the minor bulbs — those that most gratifyingly extend the season, color, and way of using, both in the garden and indoors—is noteworthy. Counting all these it is less surprising to be told that, notwithstanding the large development of American bulb production in the last twenty-five years, we still import over 450 million "bulbs."

The numerous photographic illustrations of bulbs in different stages of growth, and especially the diagrams of the forms through which bulbs progress from dormancy to flowering and back again, go far to dispel the mysteries of the subterranean life of these garden creatures. Other illustrations, in particular the thirty-one color photographs from the authors' gardens, show how garden pictures can be created by skillfully composing the many forms and colors of spring-flowering bulbs. The final chapter, "The Gardener's Bulb Selector," very helpfully classifies bulbous subjects as to kinds, season, adaptation, and uses, and lists recommended varieties.

Freeman A. Weiss

The Daffodil and Tulip Year Book, 1954. The Royal Horticultural Society, London, England. 1954. 165 pages, illustrated. $1.65, post free.

To anyone who has followed the publication of these year books for many years, the arrival of each new issue is an event. There is always much that is of little importance to anyone in his country, but of importance to the Society and its branches. This can be read or skipped at will. But there are always one or two articles that must be read with care and pleasure.

In this issue Mr. J. Lionel Richardson writes at some length of his work in raising new varieties, which is of interest to anyone who may have tried it himself. Mr. Guy L. Wilson writes of his notes through the season and Dr. A. J. Bateman, late of John Innes Horticultural Institution, presents his first paper on "The Genetics of Narcissus," this paper being on Sterility.

Of delightful interest to those who care about beginnings, is the extended paper from Charles H. Curtis, who is honored in the dedication of this issue. He has been a member of the Daffodil Committee for fifty years.

Guy Wilson deserted his own garden long enough to visit the Centennial Flora, Heemstede, Holland, of which Mr. Matthew Zandbergen also writes, and presents a paper on "Tulips," which is a somewhat different field from that of his usual writing. But as far as the tulip material goes, the most interesting paper, short too, is that by F. V. Wells, "The Polyodorous Tulip," in which he discusses the odors and scents of tulips from the point of view of a member of "the perfumery industry." There is a new vocabulary in this, in which the names of familiar garden plants are mentioned as well as chemicals not known to most gardeners. One can get many a chuckle from some of it: viz, the note under "Sibal," "*** a rather unpleasant fatty odour suggestive of oleic and certain other unsaturated fatty acids." And then three cheers for "phenylethyl dimethyl carbinol and dimethyl benzyl carbinol."

All chuckles aside, however, this book too is a must for the real lover of daffodils.

B. Y. M.

Charley Moon. Reginald Arkell. Harcourt, Brace and Company, New York. 1953. 156 pages. $2.50. (Library).

Charley Moon's family were country people who had lived for generations in Little Summerford, "as far up the Thames as you can go, and then a little farther." Charley, who had the gift of making people laugh, brought something of country freshness into the West End theatre—and London loved him for it. But it was Charley, the natural, who had to learn by himself that his nature was forever rooted in Little Summerford.

Old Herbaceous was also done by Arkell's pen and you may remember perhaps the July 1951 review in the *NHM.*

The Garden of Bellflowers. L. H. Bailey. The Macmillan Company, New York. 1953. 155 pages, illustrated. $5.00. (Library).

Dr. G. H. M. Lawrence, present Director of the Bailey Hortorium, has taken over a manuscript prepared in large part by Dr. Bailey between 1939-1944, covering his experience in growing campanulas in his own garden. The data are presented in a form more or less like that used for similar reports on pinks, gourds, larkspurs, and similar objects of Dr. Bailey's personal interest. It has the advantage of allowing presentation of all the genera related to campanulas, which are commonly called "bellflower"—mostly genera of almost equal interest to gardeners.

The preliminary pages give Dr. Bailey's own comments on the growing of campanulas in Ithaca, where he gardened. They seem to have been more uniformly successful there than they have been in some other localities that would presumably have been equally appropriate. The body of the work gives the carefully written descriptive notes with helpful indications of errors that the unlearned may fall into, some cultural notes and, most important perhaps, careful indications, though not always definite enough, of the geographical occurrence.

The illustrations, mostly line drawings, and all by Mrs. Elizabeth Burckmyer, are charmingly done and have the delightful quality of being amazingly accurate and informative without losing anything of their beauty as drawings.

B. Y. M.

Philippine Orchids. Reg S. Davis and Mona Lisa Steiner. The William-Frederick Press, New York. 1952. 270 pages, illustrated. $5.00. (Library).

Philippine Orchids is another publication emphasizing the increasing popular interest in orchids during the past few years that has resulted in the creation of a host of new orchid societies and the appearance of several new journals and general publication on orchids.

Botanically, the orchids of the Philippine Islands have been known for some years, but this is the first appearance of a book that is useful for the orchid horticulturist and amateur enthuiast. The authors are to be congratulated on this publication that gives to a vast number of interested persons a glimpse into the orchid wealth of the islands.

Although the book is written primarily for the amateur, it has something of interest and value to offer to anyone interested in orchids. The introduction is particularly informative, especially the sections on climate and flora. These sections were written with

emphasis on aiding the grower to cultivate Philippine orchids by simulating conditions found in these islands. The section devoted to history deals with orchid exploration and floristic studies from the latter part of the seventeenth century to the publication in 1925 of Oakes Ames' valuable work, *Enumeration of Philippine Apostasiaceae and Orchidaceae.* During this period of more than two hundred years many fine horticultural species, including the magnificent *Vanda Sanderiana,* were discovered in the islands.

The authors, of necessity, treat only about a tenth of the thousand or more species known to be indigenous. The species treated are found in less than half of the one hundred or more genera found in the islands. Nevertheless, these items that are illustrated and briefly described were carefully selected to include most of the plants of horticultural importance as well as to represent the genera most common to the islands.

The black-and-white photographs used to illustrate the species leave much to be desired in the way of subject matter, composition and clarity. It appears to this reviewer that more care should have been taken in photographing a number of the plates. In very few instances would it be possible to identify the plant to species if it were not already so labeled. Some of the specimen plants selected are poor representatives of the species. Fortunately, the text is well written and admirably makes up for what is lacking in many of the illustrations.

Donovan S. Correll

Cacti and Succulents. G. Gilbert Green. The Pitman Publishing Company. New York. 1953. 238 pages, with 80 pages of monochrone illustrations and 10 plates in full color. $7.00.

Mr. Green writes from his experiences with the collections at Normandale Nurseries in Sheffield and so completely covers the details of hundreds and hundreds of these "weird and wonderful" plants that everyone with any interest will find this volume a must—it treats each plant with so much cultural information that the most modest windowsill gardener will find whatever he needs, as will the cold or heated greenhouse operator in the commercial business. The many illustrations are most helpful for the beginner in deciding upon his collection. The edition was printed in Great Britain.

Wild Flowers of America. Edited by H. W. Rickett. Crown Publishers, Inc., New York. 1953. 71 pages of text and 400 color plates. $10.00.

Having been acquainted with the late Mrs. Charles D. Walcott and her fresh, vivid, botanically-accurate water-colored paintings for many years, as well as with the first Smithsonian Institution reproduction of these paintings in their handsome portfolio, the perfectionist reviewer is slightly saddened in the reproduction of these sketches by today's processes. The printer is the same, but, even with the "advances" in modern lithographic presses, color photography, and other "newer things" since the 1929 edition appeared after four long years of production, the first edition remains unexcelled. This edition was published in 2500 copies, 500 of which were de luxe, selling for $500, and the remainder were library editions at $100.

Perhaps it is wrong to remember with great admiration and compare the two reproductions of Mrs. Walcott's sketches. Mr. Duenewald has, in the present edition, done a very excellent

job of these 400 plates which are about nine by twelve inches. Dorothy Platt has loaned some of her very good illustrations for this work. Dr. Rickett of the New York Botanical Garden has provided the text—descriptions of the flowers, ecology, identification charts, glossary, etc., which facilitate identification of those plants therein included. This is an authoritative and encyclopedic volume and one that should be in every home library.

Studies in Penstemon: No. 1. Section Habroanthus (formerly of Glabri). R. W. Bennett. Compiled, published, and illustrated for the American Penstemon Society. 1953. 181 pages, mimeographed. $2.00. (Available from the author, 5607 North 22nd Street, Arlington 5, Virginia.)

This compilation attempts to present a treatment of a difficult section of a particularly taxing genus *(Penstemon)* in a manner that will be satisfactory to both the amateur and professional gardener, as well as to the taxonomist.

It is a work that unites the practical aspects of gardening with the systematics of the section. The idea cannot be too highly praised. On the other hand the execution is not as precise as would be desired. The taxonomic basis apparently is sound, although a key to the various sections would be desirable and a complete diagnosis of *Habroanthus* directly preceding the key to the species.

The line drawings are excellent and well placed. The species descriptions are complete and precise, covering the needs of both the gardener and professional botanist. The nomenclature is up-to-date and includes full synonomy. Well organized, extensive and lucid information is given concerning the methods of watering, cleaning, planting, rotation and edaphic requirements both for the section as a whole and the individual entities. The book is particularly valuable to the penstemon grower for rapid identification of the species and for good gardening practice.

Gabriel Edwin

Succulent Plants. A. Bertrand. Philosophical Library, New York. 1953. 112 pages. 23 illustrations in full color and 39 black-and-white. $4.75. (Library).

This little volume can almost pass as an introductory guide to the principal groups of succulents. The amateur interested in this group of plants will find in the first three chapters, brief notes on the geographical distribution and native habitats of succulent plants, how they may best be grown, and what their enemies are. In the remaining eight chapters one is introduced to the important plant families represented, including that of the agaves, the lilies, milkweeds, stonecrops, euphorbias, and the "mesembs." Representative genera and species are well illustrated with fine photographs both in color (with good rendition) and in monochrome. The more important species are described in the text with brief thumbnail sketches.

On page 44, it should be noted that an error made a century ago and copied and recopied by various authors again reappears: The flowers of *Aloe ferox* are scarlet or orange and not "greenish-yellow!"

W. H. Hodge

The Secret of the Green Thumb. Henry T. and Rebecca T. Northen. The Ronald Press Company, New York. 1954. 411 pages, illustrated. $5.00. (Library).

Under this very beguiling title, Dr. and Mrs. Northen have assembled an enormous amount of data, presented in almost non-technical language, that should offer no difficulties to the curious gardener. They state their case and intention clearly enough in the Preface. Perhaps the most significant sentences are: "The gardener must gain a real insight into the nature of plants and their environment. Only then will he discover the secret of the Green Thumb."

Ordinarily this reviewer does not like to quote chapter heads but these show more quickly than any other means the scope of the work undertaken and indicate that the book is not intended for the "home gardener" alone:

Life Story of Plants; Supply Lines and Operation Centers; Water; Plants at Work: Oxygen; Food for Growth: Sugar; Light; Temperature; Soils and Nutrition; Plant Hormones; Seasonal Phenomena; Planting and Propagation; Flowering; Plant Breeding; Science Explains Heredity; Insects and Other Garden Pests; Bacteria, Viruses, and Fungi; Plants Without Seeds; The Seed Plants; Evolution; Plant Communities; and Conservation. There we have it, a whole course . . . .

Without any intention of being facetious, it would seem that the book was intended chiefly for those who do not have a green thumb, and should have, whether in private life, or professional and public life!

The serious omission, which may not be too serious, is that the authors have not defined "the green thumb." In common usage—the folk level—the "green thumb" is usually offered to explain the successes, more or less one hundred per cent of the uninformed or rather uninstructed. This, like most generalizations, is a half-truth, for the person in question often has a great body of knowledge, an integral part of his knowing, but frequently incommunicable to others. The reviewer knows several such, whose successes are admirable, even if they are quite innocent of all knowledge of phloem, xylem, meristem, mitosis, and so on.

In spite of its 411 pages, there are many sections of the book that the reader will wish had been enlarged, but all will give the basis for added knowledge. Just how much other portions—particularly the last four chapters, will serve the lay reader with his immediate problems seems open ot doubt, but no page should be neglected except possibly the plant lists that are not of wide geographic interest.

The illustrations, largely borrowed, are well chosen, and widely informative, but lack unity in presentation as borrowed illustrations always must.

The book is not a "garden guide," but any gardener will be a much better one when he has assimilated this lore into his or her integral knowledge. The secret of the green thumb will never come from any book, however magical, it comes only from life itself.

B. Y. M.

Holly Check List. Holly Society of America. 1953. 56 pages. $1.00. (Library). (Available from Charles A. Young, Jr., Holly Society of America, Bergner Mansion, Gwynn Falls Park, Baltimore 16, Maryland.)

A valuable by-product of currently increasing interest in the genus *Ilex* is a holly collector's reference in the form of a Preliminary Holly Check List, recently prepared by a Committee of the Holly Society of America, under the capable chairmanship of Dr. John C. Wister of the Arthur Hoyt Scott Horticultural Foundation at Swarth-

more College. It is a listing of the seven hundred-odd species and clones of holly now in cultivation in this country with appended information pertaining to their botanical classification, synonomy and origin. Nursery sources and arboreta growing a given clone are indicated by symbols where such information is available. There are separate lists of botanical authors, discoverers and introducers, commercial sources and holly test gardens, a grouping of clones by parent species, a list of unrecognized or doubtful names and a final listing of introduced species and varieties which apparently do not exist in this country.

In pointing up information deficiencies, as well as present taxonomic confusions (with its clonal synonomy to an occasional sixth degree!), the painstaking assemblage of this booklet may stand for more than an indispensable reference for the holly collector. It may well serve as a model for other single plant societies seeking order amid their own taxonomic confusion and needing a basis for contemplated efforts in the direction of the registration of new names.

Henry T. Skinner

Arizona's Cactuses. 2nd Edition. W. Taylor Marshall. Desert Botanical Garden of Arizona, Tempe, Arizona. 1953. 116 pages, with 78 black-and-white illustrations. $1.15. (paper binding).

Director Marshall has recently revised his now famous descriptive catalogue of the species of cactuses native to Arizona, and it is published as his Desert Botanical Garden of Arizona Science Bulletin No. 1. The majority of the species listed are illustrated. The most peculiar one discussed is *Neoevansia diguetii* (Weber) Marshall, with its thirty-five sweet potato-like roots! The bulletin is prepared mainly for the non-scientific visitor to the Arizona area interested in identifying those plants of curiosity to himself. It contains a key in very easily understandable terms which should enable the layman to "run-down" any specimen at hand. (Some issues of the First Edition are available at $1.85, cloth bound.)

The Glenn Dale Azaleas. B. Y. Morrison. Agriculture Monograph No. 20, United States Department of Agriculture, Washington 25, D. C. 1953. 93 pages, 38 photographic illustrations. $.40. (Available from Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.)

This is an account of the new group of hybrid evergreen azaleas known as the Glenn Dale Azaleas. They were developed by the breeding work of the author, B. Y. Morrison, at a time when he was head of the Division of Plant Exploration and Introduction, United States Department of Agriculture. Mr. Morrison was subsequently director of the United States National Arboretum. He is also editor of *The National Horticultural Magazine* and a member of the board of editors of *The Azalea Handbook* published by the American Horticultural Society a year ago. The group takes its name from the Plant Introduction Garden at Glenn Dale, Maryland.

The booklet describes some four hundred and fifty named clones (horticultural varieties) of Glenn Dale Azaleas as to habit, height, foliage, size and color of flower, time of bloom, and parentage.

The Glenn Dale Azaleas are best viewed as several subgroups based on

early, early midseason, late midseason, late, and very late blooming periods running from the middle of April to late June in the middle-Atlantic states. Within each such group are dwarf, medium height, and tall plants and flowers with a wide range of colors. The varieties vary in hardiness but the group as a whole has been successful over wide areas in this country, and possesses a beauty of form, color pattern, and size of flower of the order of the tender Indian Azaleas of southern gardens.

The booklet includes the story of the species and clones used in the breeding work and an appraisal of their respective values in creation of the Glenn Dale Azaleas.

Never before, at least among azaleas, has the story of an outstanding hybrid group been told as fully and accurately.

A planting of specimens of the Glenn Dale Azaleas has been made in the Morrison Azalea Clonal Garden established at the U. S. National Arboretum in honor of Mr. Morrison's devotion to that Institution over many years. This garden is to be dedicated on May 3 of this year.

Frederic P. Lee

The Maple Bladder Gall

Donald L. Schuder

The silver, or soft maple, is often attacked by a tiny mite, *Vasates quadripes* Shiner, which feeds on the foliage and produces small wart-like galls on the upper surfaces of the leaves. The galls are first red, then green, and finally black in color. They may occur singly or in clusters, often so thick that the leaves become crinkled and deformed. Young trees are most seriously affected and every leaf may be covered with galls. As trees mature they become less and less subject to attack, with most of the galls being found on the lower leaves. The severity of an infestation varies from year to year in the same locality and even on the same tree.

The mites themselves are whitish, or pinkish, in color and over-winter in crevices of the bark and possibly in the bud scales. The mites migrate upward from their winter quarters the latter part of April, about the time the buds break, and by the time the leaves are an inch in diameter the future site of the galls may be seen as tiny red areas. The galls cannot be shown to cause serious damage to the trees, but their presence causes a great deal of consternation among homeowners, arborists and nurserymen alike, and they want to prevent their occurrence.

In the past, liquid lime-sulphur at dormant strength has given excellent control of this gall-inducing mite when applied in early April, but a great problem is presented when the trees to be sprayed stand near a house since the spray stains siding, stone, brick, cement and wood. If a time when the wind was blowing away from the house could not be found, the owner had to decide between the galls and the staining of his home.

A large number of effective insecticides and miticides have been developed since World War II. A series of nineteen of these materials were applied to a block of eight-foot silver maple trees

[1]Reprinted by permission of Paul E. Tilford, Editor, Arborist's News, in which original publication appeared April, 1953, Vol. 18, No. 4.

on April 9th and 11th, in hopes of finding a more generally useful control measure for the maple bladder gall. The sprays were applied with a small power sprayer operating at a pressure of two hundred pounds per square inch.

The effectiveness of these chemicals in preventing the maple bladder galls was rated independently by two entomologists on May 21. Their examinations showed four of the materials to be as effective as liquid and dry lime-sulfurs in preventing infestations of the galls: parathion, systox (when applied to the trunk and branches), potasan and malathon. All of these materials produced nearly gall-free foliage.

The application of eight of the chemicals resulted in foliage that was less heavily infested than the untreated trees, but had more galls than the previously mentioned materials. They were DN dry mix, metacide, pestox 3, aramite, dimite, sulphenone, TEPP, ovotran and EPN 300. The effectiveness declined in the order named.

Four of the chemically treated plots contained trees with just as many, or more galls, than in the untreated group. These ineffective materials were Monsanto's 3897, systox (when applied to the soil only), Geigy's 338 and TEAP.

Terminal growth measurements were made and no differences could be demonstrated as the result of the application of any of these materials tested. Apparently there was no phytotoxicity or stunting of growth.

As a result of this one season's work, it can be concluded that, when liquid or dry lime-sulfurs cannot be used because of the possibility of staining, parathion, malathon, systox and potasan may be substituted. In one hundred gallons of water use two pounds of fifteen per cent parathion wettable powder, or two quarts of forty-eight per cent systox, potasan, or six to seven pints of malathon. All of these materials are phosphate insecticides and highly dangerous, and the precautions listed by the manufacturer should be strictly adhered to. Malathon is the least toxic of this group of insecticides, but possibly slightly less effective.

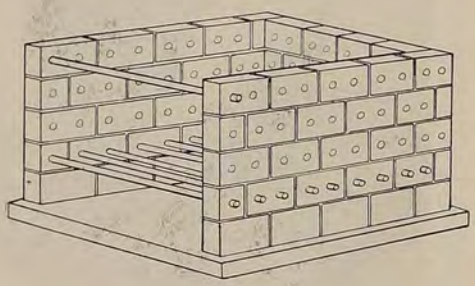
The insecticide selected should be

applied in the early part of April, just before the buds break. Thorough coverage of all parts of the trunk, limbs and branches is essential. A pressure of two hundred pounds per square inch, or higher, is desirable in order to penetrate all cracks and crevices.

A Durable and Safe Trash Burner

FREEMAN A. WEISS

A substantial receptacle for burning waste paper, leaves (if you must!), and combustible trash from the house and garden can be easily constructed by the handy man, using perforated brick and discarded iron pipe. It has the added advantages of being not unsightly (as trash burners go), of keeping the contents in place before and during combustion, and of being easily cleanable of ashes and noncombustible material. It will outlast any number of wire burners.



The accompanying sketch shows how the bricks and pipe are assembled. The base is a concrete slab about four by five feet, or it can be laid with old bricks, discarded sidewalk blocks, or broken concrete paving. The lowest tier of bricks should preferably be fire- or four quarts of thirty per cent resistant. The upper tiers are laid with perforated bricks, each with two holes about one and an eighth inches in diameter, such as are now frequently used in the interior of house walls. Five bricks long and four wide, giving ground dimensions of about forty by thirty-two inches, provide a convenient size.

One-inch (inside diameter) iron pipe is preferred; it just fits the holes and will not sag or burn easily even under a hot fire. The pipe is simply cut to length and inserted through the holes of the second tier of bricks. It is advisable to set a similar pipe in the top tier across the open front as support for the walls; this should be cemented in place. An iron grating as a cover can be added if desired, but is not really needed to keep the burning contents in place. The perforations in the bricks provide a good draft so that green brush and damp leaves will burn up clean.

The open front and solid floor make it easy to shovel out ashes and incombustible material, and the pipes can be removed for more thorough cleaning.

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