

The NATIONAL
HORTICULTURAL
MAGAZINE



JOURNAL OF THE AMERICAN HORTICULTURAL SOCIETY

APRIL, 1942

The American Horticultural Society

PRESENT ROLL OF OFFICERS AND DIRECTORS

April 11, 1942

OFFICERS

President, Dr. D. Victor Lumsden, Washington, D. C.
First Vice-President, Dr. E. A. Merritt, Washington, D. C.
Second Vice-President, Mrs. Robert Woods Bliss, Washington, D. C.
Secretary, Miss Cary B. Millholland, Washington, D. C.
Treasurer, Mr. J. Marion Shull, Washington, D. C.

DIRECTORS

Terms Expiring 1943

Mrs. Robert H. Fife, New York, N. Y.
Mrs. Mortimer J. Fox, Peekskill, N. Y.
Mrs. Fairfax Harrison, Belvoir, Farquier
Co., Va.
Mr. B. Y. Morrison, Washington, D. C.
Dr. Donald Wyman, Jamaica Plain, Mass.

Terms Expiring 1944

Mrs. Walter Douglas, Chauncey, N. Y.
Mrs. J. Norman Henry, Gladys, Pa.
Mrs. Clement S. Houghton, Chestnut Hill,
Mass.
Mr. Alfred Maclay, Tallahassee, Fla.
Mrs. Arthur Hoyt Scott, Media, Pa.

HONORARY VICE-PRESIDENTS

Mr. Ferd P. Neels, Pres.,
American Begonia Society,
426 East Maple Ave.,
El Segundo, Calif.

Dr. Robert T. Clausen, Pres.,
American Fern Society,
Bailey Hortorium,
Ithaca, N. Y.

Mr. W. J. McKee, Pres.,
American Iris Society,
45 Kenwood Ave.,
Worcester, Mass.

Dr. Earle B. White, Pres.,
American Peony Society,
1726 Eye St., N. W.,
Washington, D. C.

Mr. Walter D. Blair, Pres.,
American Rock Garden Society,
Tarrytown,
New York.

Mr. A. F. Truex, Pres.,
American Rose Society,
3150 South Zuni,
Tulsa, Oklahoma

Mr. Wm. T. Marshall, Pres.,
Cactus & Succulent Society of America,
327 North Ave., 61
Los Angeles, Calif.

Mr. James H. Porter, Pres.,
Camellia Society of America
Macon, Ga.

Dr. S. E. Taylor, Pres.,
Delphinium Society,
241 Lexington Ave.,
Mansfield, Ohio

Mrs. John H. Cunningham, Pres.,
Herb Society of America,
53 Seaver St.,
Brookline, Mass.

Mrs. William Beaudry, Pres.,
Midwest Horticultural Society,
100 North Central Park Blvd.,
Chicago, Ill.

SOCIETIES AFFILIATED WITH THE AMERICAN HORTICULTURAL SOCIETY

1940

Akron Garden Center,
226 South Main St.,
Akron, Ohio.

Alexandria, Virginia, Garden Club,
Mrs. C. C. Wall, President,
Mt. Vernon, Va.

American Amaryllis Society,
Mr. Wyndham Hayward, Secretary,
Winter Park, Fla.

American Begonia Society,
Mr. Ferd P. Neels, President,
426 East Maple Ave.,
El Segundo, Calif.

American Fuchsia Society,
Miss Alice Eastwood, Secretary,
California Academy of Sciences,
Golden Gate Park,
San Francisco, Calif.

California Garden Club Federation,
Mrs. Chas. P. McCullough,
Box 114
Altadena, Calif.

California Horticultural Society,
Miss Cora R. Brandt, Secretary,
300 Montgomery St.,
San Francisco, Calif.

- Chevy Chase (D. C.) Garden Club,
Mrs. E. B. Bunting,
3726 Windom Place, N. W.,
Washington, D. C.
- Chevy Chase (Md.) Garden Club,
Mrs. R. Seabury d'Espard,
19 W. Thornapple St.,
Chevy Chase, Md.
- Community Garden Club of Bethesda,
Miss Sue Thomas, Pres.,
6808 Exfair Rd., Edgemoor,
Bethesda, Md.
- Fauquier and Loudoun Garden Club,
Mrs. W. F. Rust, President,
Leesburg, Va.
- Federated Garden Clubs of Cincinnati and
Vicinity,
Mrs. Charles Bosworth, President,
Cincinnati Country Club,
Grandin Rd.,
Cincinnati, Ohio.
- Federated Garden Clubs of Maryland,
Mrs. Edward H. McKeon, Pres.,
Room 300, The Belvedere,
Baltimore, Md.
- Forest Hills Garden Club,
Mrs. E. Barr, Pres.,
3623 Chesapeake St., N. W.,
Washington, D. C.
- Garden Center of Greater Cleveland,
East Boulevard at Euclid Ave.,
Cleveland, Ohio.
- Garden Center Institute of Buffalo,
Delaware Park Casino,
Buffalo, New York.
- Garden Centre,
% Iveys Store,
Asheville, N. C.
- Garden Club of Gloucester,
Mrs. N. S. Hopkins, Librarian,
Nuttall, Va.
- Garden Club of Illinois,
Shop 312, Palmer Hotel,
Chicago, Ill.
- Garden Club of Nashville,
Mrs. Guilford Dudley, Pres.,
Harding Place,
Nashville, Tenn.
- Garden Club of Virginia,
Mrs. John G. Hayes,
R. F. D. No. 2,
Richmond, Va.
- Garden Forum of Youngstown,
% Public Library,
Youngstown, Ohio.
- Gary Garden Club,
Mrs. Roy Watts, Treas.,
106 N. Hamilton St.,
Gary, Ind.
- Georgetown Garden Club,
Mrs. Walter J. Harrison,
1430 - 33rd St., N. W.,
Washington, D. C.
- Halten Garden Club,
Mrs. J. Jackson Smith, Pres.,
Gittings, Md.
- Home Garden Club of Denver,
800 Monroe St.,
Denver, Colo.
- Homeland Garden Club,
Mrs. Guy Warfield, Jr., Pres.,
314 Thornhill Road,
Baltimore, Md.
- Indian Head Garden Club,
Mrs. Frank A. Bolton,
Pomonkey, Md.
- Lake Washington Garden Club,
Mrs. Thomas Balmer, Pres.,
3500 46th Ave., N. E.,
Seattle, Wash.
- Liambias House,
St. Augustine Garden Club Centre,
St. Augustine, Fla.
- Men's Garden Club of America,
Hoyt F. Paxton, Secretary,
R. D. 2, Hendersonville, N. C.
- Michigan Horticultural Society,
Paul R. Krone, Secy.,
Horticultural Building,
East Lansing, Mich.
- Midwest Horticultural Society,
Miss Dorothy Wibel,
2155 Pierce St.,
Chicago, Ill.
- National Capital Dahlia Society,
Mr. George U. Graff,
242 Peabody St., N. W.,
Washington, D. C.
- North Carolina Garden Center,
Miss Violet Holt,
500 Webb Ave.,
Burlington, N. C.
- Northern Nut Growers Association,
Mr. Carl Wescheke, Pres.,
96 South Wabash St.,
St. Paul, Minn.
- Ohio Association of Garden Clubs,
% Mrs. Silas B. Waters,
2005 Edgecliff Point,
Cincinnati, Ohio.
- Rock Garden Society of Ohio,
Mrs. Frank Garry, Librarian,
Montgomery Station Post Office,
Montgomery, Ohio
- Seattle Civic Garden Center,
1908 Fourth Avenue,
Seattle, Wash.
- Takoma Horticultural Club,
Mr. W. H. Parsons, Pres.,
710 Elder St., N. W.,
Washington, D. C.
- The Little Garden Club of Sandy Spring,
Mrs. Douglas Whitlock, Pres.,
Sandy Spring, Md.
- The Pittsburgh Garden Center,
Schenley Park,
Pittsburgh, Pa.
- The San Francisco Garden Club,
Room 133, Fairmont Hotel,
San Francisco, Calif.
- The Valley Garden Center,
2700 N. 15th Street,
Phoenix, Ariz.
- Tri-County Garden Club,
Miss Lilian Lawrence, Sec'y,
Bell Street School,
Clinton, S. C.
- The Trowel Club,
Mrs. Walter Wyatt, Pres.,
1702 Kalmia Road, N. W.,
Washington, D. C.
- Washington Garden Club,
Mrs. Lee Sanford, Pres.,
6408 Utah Ave., N. W.,
Washington, D. C.
- Woodlawn Garden Club,
Mrs. Asher I. Lohman, Secy.,
1628 North Woodstock St.,
Arlington, Va.
- Woodridge Garden Club,
Mr. A. H. Hester, Pres.,
1824 R. I. Ave., N. E.,
Washington, D. C.
- Worcester County Horticultural Society,
30 Elm Street,
Worcester, Mass.

The National Horticultural Magazine

Vol. 21

Copyright, 1942, by THE AMERICAN HORTICULTURAL SOCIETY

No. 2

APRIL, 1942

CONTENTS

Spring Comes Twice in New Mexico. ESTELLE L. SHARP	55
Fruits and Vegetables of the Eighteenth Century. LOUISE B. FISHER	57
California Daisy Pageant. LESTER ROWNTREE	61
When Does <i>Lilium Catesbaei</i> Bloom?	66
The Longevity of Plants. ROBERT M. SENIOR	68
A New Commercial Oil Palm in Ecuador. O. F. COOK	70
About Lilies. VIOLET NILES WALKER	86
Rock Garden Notes:	
Choice Drought Resistant Rock Plants. P. DONOFRIO	90
<i>Dryas Sundermanni</i> . FRED M. ABBEY	91
Rhododendron Notes:	
Notes on Rhododendron Species at the Botanical Garden, University of California—Part 2. P. H. BRYDON	93
On the Behavior of Rhododendron Species and Hybrids in Virginia. POWELL GLASS	94
A Book or Two	97
The Gardener's Pocketbook:	
<i>Erigonum sub-alpinum</i> . KATHLEEN N. MARRIAGE	99
<i>Erigonum ovalifolium</i> . KATHLEEN MARRIAGE	100
From the Midwest Horticultural Society. ELDRÉD E. GREEN:	
<i>Akebia quinata</i>	100
<i>Convallaria majalis</i> , pink	100
<i>Azalea Vaseyi</i>	101
Tree ferns of Hawaii	102
Alliums (Onions!). BERNARD HARKNESS	102
<i>Molucella laevis</i>	104
<i>Adenium obesum</i>	104
Sternbergias. ROBERT C. MONCURE	106
<i>Primula Forrestii</i> . H. JEFFREY	108
<i>Bletilla striata</i>	108
<i>Bauhinia</i> sp.	110

Published quarterly by The American Horticultural Society. Publication office, 32nd St. and Elm Ave., Baltimore, Md. Editorial office, Room 821, Washington Loan and Trust Building, Washington, D. C. Contributions from all members are cordially invited and should be sent to the Editorial office. A subscription to the magazine is included in the annual dues to all members; to non-members the price is seventy-five cents the copy, three dollars a year.



Lester Rowntree

Coreopsis gigantea
(*Giant coreopsis*)

Spring Comes Twice in New Mexico

ESTELLE L. SHARP

AN opportunity for a quick trip to New Mexico arose this summer. It was August with a drought in the East. The West was having unprecedented rains. If I went I would see the yuccas in bloom. I might collect seeds of some of the plants I saw in flower out there several springs ago. It would be fun to see how many things I could recognize after working over the herbarium specimens collected in '37. I packed up and was off in no time, leaving a hot and humid but exceedingly dry countryside behind me.

New Mexico was cool. Great cumulus clouds floated across the sky frequently hiding the usually burning sun. The streams were full, the hillsides green. The yuccas, to be sure, were nearly over (a plague of grasshoppers had hastened their demise) but there were so many other flowers that it seemed spring had come again to New Mexico.

Baileya multiradiata was blooming along the roadsides, perhaps not quite as fresh looking as when I had been attracted by it before in early May, but still going strong. This is now in the trade. The year I tried it in the East, 1940, happened to be a wet season and it turned out to be nothing but another straggily yellow composite.

Argemone platyceras was most abundant everywhere. There was ripe seed on the lower branches of the same plant that was bearing gorgeous white blossoms and more buds to come at the tips. Such a habit in plants is most considerate to the plant collector. To be able to see the plant in flower and fruit at the same time is not only helpful in identification but also saves the

time that one would otherwise have to take to return for ripe seeds weeks later. Even when this is possible the results are often disappointing due to the plant's possible destruction by animals or insects in the interim.

A yellow cathartolinum on the mesa wall was likewise obliging and a lavender penstemon. (I hesitate in writing penstemon with one "t" for the word means 5 stamens and is often written "Pentstemon," but the earliest form with one "t" is correct. Priorities rule in botanical nomenclature!) One could see the older woody branches of these plants which bore the seed had bloomed in the spring, then with the arrival of the rains, fresh green shoots grew out and produced a second crop of flowers.

Calochortus nuttalli, however, was not so obliging. Many dry and empty seed pods were to be seen all over the mesa but it took some hunting to find a few seeds to carry home. *Fallugia paradoxica* (Apache Plume) offered ripe seed as well as flowers just as it had in the month of May; and the Rabbit brush (*Chrysothamnus*), which in some parts of New Mexico is crowding out the grama grass, essential for grazing, was full of yellow blossoms with ripe seed on the lower branches. This, by the way, is related to the now much talked of guayule, the rubber plant, and itself contains some rubber in roots and stems.

Although my time was short I was determined to ride up along the creek to the falls to collect some seed of the most gorgeous *Aquilegia chrysantha* which I had seen in bloom on a previous trip. What fun it was to try to remember the names of plants as we

rode along. They seemed like old friends not seen for a long time. Much better than some old college reunion, for there were no gray hairs or "middle age spreads" to disturb one! There are the sycamores just as I remembered them but the leaves are much more pointed than ours. *Platanus wrightii*—how smart I felt! And the pink locust, no second blooming for it, *Robinia rusbyi*. The two junipers were easy as I had been seeing them all over the state. *Juniperus pachyphloea* which has the pink mistletoe, (the white mistletoe grows on the oak) and *J. monosperma* (cedar) with shreddy gray bark. *Pinus edulis* famous for its nuts, is not so abundant right here but at higher elevations is almost monotonous it grows so extensively. And then the oaks! But they were my downfall! It was easier to identify the mesquite (*Prosopis*), Creosote Bush (*Covillea*) and Mountain Mahogany (*Cercocarpus*). Walnut, elder, mountain maple, willows, all similar to familiar varieties but the specific names would escape me.

Alongside my columbine whose pods fortunately still held a few seeds, grew *Lobelia splendens* and a tall yellow oenothera which I have yet to identify. *Arabis eriophylla* in the rock crevices close by had seeds to offer, and I did not have to look far to find two species of the wooly *Cheilanthes* ferns.

There was no time to ride up in the high mountains but we took a very civilized trip in the car to Willows Creek, a mecca for fishermen. Here, above 8,000 I had a few hours to prowl around. It was nothing short of agony to see so much and to be so hurried. The boys kept calling to come eat lunch or there

would not be any left. For once in my life food did not interest me!

We had driven up the mountain curves through a terrific thunder storm with hail. Now at the top the sun was out and everything shone with raindrops. *Abies concolor*, and both the Engelmann and the Colorado Blue Spruce had green moss dripping from their branches. It was cold, uncomfortably so when your hands and feet were wet from crossing streams and brushing against dripping bushes. The results of such a climate were in great evidence all about. The plants were so tall and robust that it took time to fold them into a normal size press. Penstemons, delphinium, forgetmenots, even wallflowers, had to be bent and curled around to fit in between the sheets. The deep red potentilla, mertensia, and polemonium were as exciting as when I found them in early spring, perhaps even more so when I remembered this was mid-August. *Campanula rotundifolia* grew so tall I hardly recognized it. Where in the temperate zone does this cheerful plant *not* grow?

Heuchera blossoms, a blush pink, abounded on the hillsides, their stalks bent over with the weight of the raindrops. Even showier was a creamy white spirea (*Sericotheca dumosa*). Great racemes of many tiny white flowers stood up well above the gray green foliage.

There seemed to be almost that superfluity of blossoming which one feels at moments in a favorable spring. Surely I had gotten my dates mixed, or else, spring comes twice in New Mexico!

Fruits and Vegetables of the Eighteenth Century

LOUISE B. FISHER

Now that the attention of a great many Americans is turned toward vegetable and fruit raising, it may be of interest to look back and see what our forefathers accomplished along the same line. Probably everyone has read stories of the wonderful fruitfulness of our country during the time of colonization, and as early as 1650 we find the following statement:

"From Virginia. By Edward Williams, Gent. London. . . . Oranges, Lemons, Pineapples, Plantanes, Peaches, Apricocks, Peares, Aples, in a word all sort of excellent Fruits will grow there in full perfection; you may sleepe while they are growing, after their setting or engrafting theree needes no more labor but your prayers, that they may prosper, and now and then an eye to prevent their casualties, wounds or diseases."

The pineapple was introduced to England about 1690, and of course grown in the "Stove." Philip Miller in 1737 writes of it, "but it hath been very lately that it was introduced into *European* Gardens, so as to produce Fruit: The first Person who succeeded in this Affair, was Monsieur *Le Cour* of *Leyden* in *Holland*, who, after a great many Trials with little or no Success, did, at length, hit upon a proper Degree of Heat and Management, so as to produce Fruit equally as good (tho not so large) as those which are produced in the *West Indies*, as hath been often affirm'd by Persons, who have lived many Years there: . . . When the Fruit is to be eat, you may take the Stalk thereof in one Hand, and the Crown of the Fruit in the other, and by gently twisting it, they will readily part,

and the Crown will come out more intire, and fit for planting, than if cut off, and the Fruit will be less injured. Then you may cut it into transverse Slices, in proportion to the Company that is to eat it, laying them singly on a Plate; the outside Coat must be pared off, as in many other Fruits, which would be troublesome in eating; the Inside of a good Fruit will cut almost as firm as a Nectarine, and is of a most delicious Flavour, and very full of Juice, and is justly termed the King of Fruits."

Our persimmons were also well thought of, and compared favorably with the English Medlar, according to John Bartram. He claimed that "one of our Persimmons is worth a dozen of them (Medlars), for goodness in eating, and as big." Peter Kalm, while traveling in this country, gives us a good description of them and their effects:

"Its little apples looked very well already, but are not fit for eating, before the frost has affected them, and then they have a very fine taste. Hesselius gathered some of them, and desired my servant to taste of the fruits of the land; but this poor credulous fellow had hardly bit into them, when he felt the qualities they have before the frost has penetrated them. For they contracted his mouth so that he could hardly speak, and had a very disagreeable taste. This disgusted him so much that he was with difficulty persuaded to taste of it during the whole of our stay in America, notwithstanding it loses all its acidity, and acquires an agreeable flavour in autumn and towards the beginning of winter. For the fellow al-

ways imagined, that though he should eat them ever so late in the year, they would still retain the same disagreeable taste."

William Byrd, in his *Natural History of Virginia*, describes two kinds of figs. "One is low and bears a good fruit, which is very large. The other grows tall and thick, gives a beautiful shade, and bears very abundantly. Its figs are somewhat smaller, but, on the other hand [they are], better. They are also more pleasant and sweeter."

In England, Loudon tells us, "the fig was cultivated entirely for the desert; but in fig countries it is eaten green or dried, fried or stewed, and in various ways, with or without bread or meat, as food. Abroad the fig is introduced during dinner, as well as at the desert. In common with the melon, it is presented after soup; and the person who cuts a fig, holds it by the small end, takes a thin circular slice off the large end, and then peels down the thick skin of the fruit in flakes, making a single *bonne bouche* of the soft interior part."

Strawberries, apricots, and cherries were enjoyed during their season in great variety. These fruits were also forced for use in April, Hill writing, "This little Desert will please, because of the early Season, beyond all pomp of Summer." William Byrd must have had cherry trees in abundance, judging from the quantities of cherries he consumed. He also on several occasions sent them to the Governor in Williamsburg. One wonders if the birds were as fond of them then as now, and finds the answer: "We found to our great surprise that the wild pigeons had eaten all the black-hearts"—in one of the May entries of the *Secret Diary*.

Peter Kalm, in his *Travels*, expressed great surprise at the number of fruit trees he found at every house, especially the great quantity of ripe

peaches. The leader of his party jumped over into an orchard, and gathered fruit for all the party, the workmen in the orchard not even noticing. There was so much ripe fruit that it was fed to the swine. He tells how the fruits were dried for winter use—cut into four parts, sewed onto a thread, and hung up to dry in the sun, with several trips to a warming oven during the process, and then "baked into tarts and pyes, or boiled and prepared as dried apples and pears were in Sweden."

There were many kinds of apples, pears, and grapes, some of which were stored for winter use. William Byrd, in his *Natural History of Virginia*, lists twenty-five sorts of apples, seven of which "One can preserve all year long." He adds, "There are probably many other species of apples in Virginia, which are too numerous to mention. For this reason I wanted only to describe the best species of them." An interesting item from Washington's *Diary* shows that thievery in orchards was common then as now: "From the Scarcity of Apples generally this year, and the depredations which were committing every Night upon the few I have, I found it necessary (tho much too early) to gather and put them up for Winter use." Byrd mentions twenty-nine varieties of pears, six of which could be kept all winter. Of grapes he writes that there are six species found in the forests, and many varieties, both European and Indian, planted in the gardens, where they do very well. They "grow so quickly that they bear fruit in the first year."

"Pomegranates," he adds, "are also found at the homes of the fanciers, and they become exceptionally beautiful and good in this land." Earlier, in his *Secret Diary*, Byrd mentions sending "four great pomegranates" to the Governor in Williamsburg. Catesby, too, recalls seeing them "in great perfec-

tion in the Gardens of the Hon. William Byrd, Esq; in the freshes of James river in Virginia." In 1762, Collinson wrote Bartram: "Don't use the Pomegranate inhospitably, a stranger that has come so far to pay his respects to thee. Don't turn him adrift in the wide world; but plant it against the south side of thy house, nail it close to the wall. In this manner it thrives wonderfully with us, and flowers beautifully and bears fruit this hot year. I have twenty-four on one tree, and some well-ripened." Hill adds, "If left ungathered it will burst upon the Tree and show its crimson Grains with vast Beauty."

Vegetables seem to have been grown in abundance. John Randolph, in his *Treatise on Gardening*, lists practically all of them that are in use today. His most important contribution to gardening in this country is to be found in his remarks on the climatic differences between England and Virginia. For instance, Philip Miller's directions for sowing spring Cauliflowers are altered, "allowing for the difference of climate, the ratio of which ought to be a month sooner in the Spring, and the same later in the Fall;" and he finds Virginia winters too severe to permit sowing radishes in October, as was done by London gardeners for an early spring crop. In describing the culture of the artichoke, he makes the interesting observation that he has "been informed the leaves clean pewter the best of anything." "The Jerusalem Artichoke (*Helianthus*) is only a species of Sunflower, with a tuberous root, not unlike the Potatoe. Some admire them, but they are of a flatulent nature, and are apt to cause commotions in the belly." He adds, "Carrots, *Daucus*, are of two sorts, the orange and white. In November take up your roots and put them in dry sand, and you may use them as occasion requires."

He gives instruction about blanching

celery and definite directions for growing cucumbers "if you require them in April." To have a succession of lettuce, he writes, "When I say sow the seed every month, I mean only the growing months, the first of which February is esteemed and August the last. In August you should sow your last crop, about the beginning of the month, and in October transplant them into a rich border, sheltered from the weather by a box with a lid, which should be opened every morning and closed in the evening, and the month of February you will have fine lettuces."

Asparagus was one of the most popular of the vegetables, and is mentioned repeatedly. William Byrd quite often dispensed with his rule of eating only one thing at a time, and to his fish or squirrel added "a little asparagus." This, too, was forced for early consumption, as Hill tells us, "Asparagus at *Christmas* is reckoned a great Delicacy; but it is very much inferiour to that which comes at a more natural Season. However, for those who chuse to supply their Tables at that Time, this is the Period of preparing for it. . . ."

Peter Kalm wrote that he found Okra planted in the gardens here. "The fruit, which is a long pod, is cut while it is green, and boiled in soups, which thereby become as thick as pulse. This dish is reckoned a dainty by some people, and especially by the negroes." He adds, "*Capsicum annum*, or Guinea pepper, is likewise planted in gardens. When the fruit is ripe, it is almost entirely red, it is put to a roasted or boiled piece of meat, a little bit of it being strewed upon it, or mixed with the broth. Besides this, cucumbers are pickled with it: Or the pods are pounded whilst they are yet tender, and being mixed with salt are preserved in a bottle; and this spice is strewed over roasted or boiled meat, or fried fish,

and gives them a very fine taste. But the fruit by itself is as biting as common pepper." "Pease," Kalm tells us, "which they also sow, they have always had amongst them, before any foreigners came into the country."

"The corn which the Indians chiefly cultivate is the Maize, or *Zea Mays* . . . But besides this, they likewise plant a great quantity of Squashes, a species of pumpions or melons, which They have always cultivated, even in the remotest ages. The Europeans settled in America got the seed of this plant, and at present their gardens are full of it; the fruit has an agreeable taste when it is well prepared."

Watermelons and muskmelons were both well known in the North as well as the South. Byrd often speaks of sending a slave out to gather watermelons, and of eating them immediately. This corresponds to the theory of young marauders of today, who assert that they are best eaten right in the field. Peter Kalm thought that watermelons in this country were extremely delicious. He saw one at Governor Clinton's in September, 1750, "which weighed forty-seven English pounds." He adds, "In the English plantations they likewise keep them fresh in dry cellars, during part of the winter. They assured me that they keep better when they are carefully broke off from the stalk, and afterwards burnt with a red-hot iron, in the place where the stalk was fastened. In this manner they may be eaten at Christmas, and after. Few people, however, take this trouble with the watermelons, because they are very cooling, and the winter being very cold too, it seems less necessary to keep them for eating in that season, which is already very cold."

After listing the fruits, nuts, trees, vegetables, etc., Byrd, in his *Natural History of Virginia*, closes with the

statement, "One finds *coffee trees* and *tea trees* or *bushes*, at the homes of many fanciers of beautiful fruits, especially in the aforementioned president's beautiful and fine garden, where one sees several species of them, as well as all sorts of curious and marvelous plants and trees from the whole wide world brought together there, which are however, too extensive to mention in this place."

BIBLIOGRAPHY

Byrd, William, *Natural History of Virginia*; ed. & tr. by R. C. Beatty and W. J. Mulloy. Richmond, Va., Dietz Press, 1940 (Ms. 1737).

The Secret Diary of William Byrd of Westover, 1709-1712; ed. by L. B. Wright and M. Tinling. Richmond, Va., Dietz Press, 1941.

Catesby, Mark, *The Natural History of Carolina, Florida, and the Bahama Islands*. London, B. White, 1771. 2 v.

Darlington, William, *Memorials of John Bartram and Humphry Marshall*. Philadelphia, Lindsay and Blakiston, 1849.

Force, Peter, *Tracts and Other Papers*. Washington, 1844. v. III (1650).

Hill, John, *Eden*. London, T. Osborne, 1757.

Kalm, Peter, *Travels into North America*. London, T. Lowndes, 1772. 2 v.

Loudon, J. C., *An Encyclopedia of Gardening*. London, Longman, 1826.

Miller, Philip, *The Gardeners Dictionary*. London, Rivington, 1737-1739. 2 v.

Randolph, John, *A Treatise on Gardening*. Richmond, Va., Reprinted by Appeals Press, Inc., 1926 (Original ed. 1793).

Washington, George, *The Diaries of George Washington, 1748-1799*; ed. by J. C. Fitzpatrick. Boston, Houghton, 1925. 4 v.



Lester Rowntree

Encelia farinosa

California Daisy Pageant

LESTER ROWNTREE

It may be that the violent yellow of the American native, *Coreopsis lanceolata*, which dominates many summer gardens throughout the whole United States, has thrown me off yellow-flowered composites. If they were only the very pale lemon yellow of marguerites or the light chinese yellow of *Linum campanulatum* instead of that excessively bright shade of Aureolin, they would not rub me the wrong way.

Perhaps it is California and its plethora of yellow daisy species which has spoiled me for these flowers. The state is cluttered up with them; there must be almost two hundred species, some of which settle down in masses over acres of land so that in spring time,

along out-of-the-way roads and even occasionally on the highways, you travel through miles of them. I go through the country—or did before becoming rubber conscious, putting down my notes, “acres of yellow—just *Coreopsis stillmanii*,” and “patches of gold; only *Coreopsis bigelovii*,” meanwhile keeping a gimlet eye out for a daisy of a lighter and softer shade. This horde of western (and particularly southwestern) yellow daisies dampened my ardor for those which I saw in the east and I am sure that I grieved gardening friends there by not exhibiting more honest enthusiasm over *Chrysogonum virginianum* and its like.

Because I am blighted by this dis-



Lester Roventree

Enceliopsis argophylla var. *grandiflora*

taste of many yellow wild daisies, I feel that I should somehow make it up to this overpowering large assemblage by pointing out some of the nice things about a few of its members, in that way helping to atone for my excoriations. The daisy shape could not be lovelier; it is simple, unpretentious and altogether charming—combining just the qualities we ask of a flower form. The foliage is often very attractive; the tall ones have much decorative value and the small annuals have endless virtues as gap fillers. The fact that they grow, particularly in the southwest, in such fascinating and abandoned places takes much of the curse off the yellow daisies and some individuals have such downright beauty that you forget their blatant relatives.

One of these is *Enceliopsis argophylla* var. *grandiflora* which is limited to the west side of the Panamint Moun-

tains, a range bordering on Death Valley, whose little cañons, as well as harboring this Panamint Daisy, reek with lore of gold mining days and still contain the remnants of ghost towns. The pearly two foot stems rise, straight and smooth, from the centers of tufts of leaves that have the silkiness of a puppie's ear over the texture of felt, and the luster of a frosty morning. The flowers may be five inches across or more and the rays are a good soft yellow. In the alluring spots where the Panamint Daisy grows, one may hear the trills of cactus, rock and canon wrens, and its plant associates are such entrancing things as *Delphinium parishii* which has all the shades of the new delphinium hybrids, the giant silver-leaved *Lupinus magnificus* and the intensely brilliant scarlet desert Indian paintbrush, *Castilleja angustifolia*. One spring day when I was gloating



Lester Rowntree

Coreopsis maritima

alone in a tiny desert canon whose rim was fringed and sides were adorned with this platinum-leaved daisy, a small yellow jeep-like contraption came cavorting down over the boulders—(there was no road). In it were two Indian girls, evidently with a flair for just this shade of yellow. The Panamint daisy flower just matched their car, they had tied bunches of it to the hood and sides, armfuls of it were piled on the seat between them and blossoms had been stuck in their hair. They waved joyously as they passed me and rollicked on down to the road at the cañon's mouth.

Another desert daisy, *Encelia farinosa*, is a shrub-like plant sometimes five feet tall when in bloom and often wider than it is tall. When in flower and viewed horizontally, the bush seems to be divided into three layers. The ovate leaves, like thin leather and

silvery—as so much desert foliage is, stop abruptly after recovering the rounded bush. Above this grey-white surface rise the shining bright yellow naked flower stems, making an eighteen inch network. Near the top, these stems branch, each branchlet holding a terminal bloom so that the top layer is one of golden daisies. This plant, whose common name is Incienso occurs very frequently on desert valleys, benches and mesas and its wide chalky shapes spatter the alluvial fans which spread out below many desert canons, ascending them a little way up into the narrowing gorges.

From the throng of annual yellow daisies native to the south-west and hitherto almost ignored by eastern seedsmen, *Baileya multiradiata* has, for some occult reason, been picked out, featured in catalogues and baptized "California Sunshine," a name by

which a great many Californian wild flowers are known. It is useless to attempt to grow this desert (or semi-desert) plant unless you know something about its habitat. In the east there must have been many failures with it. *Baileya multiradiata* should be sown where it is to grow and only after the days have become really warm. If the drainage is good, it will grow in heavy soil but it prefers a light root run as it often makes very plain by coming up in gravel paths and not in the adjacent beds where most of the seed has landed. It should be happy on a hot sunny bank. This branching eighteen inch yellow daisy with soft white foliage, demands very little water after it is well started and much heat during its flowering period. *Baileya pauciradiata* is a rather stiffer and lower plant, with lovely white, hairy stems, and buds and flowers of a good light sulphur shade. The thing which particularly endears these *Baileya* to me is the double row of square-edged ray flowers and the uncompromising way the blooms have of staring straight up at the sky. In their native heath, (Arizona and south-eastern California) both of these species are perennial and grow with desert verbenas, evening primroses, gilies and phacelias.

Civilization is pushing back these blazing blocks of yellow and one must now go further off to see most of the wide patches of composites, but it is not necessary in April to go off highway 101 to see *Monolopia major* mobilized in masses. Close to King City, while with one eye, you try to ignore such signs as "bar-b-q" and "Tumble Inn," you see in front of you far hillsides plastered with yellow. These bare overgrazed buttes have only recently turned from the corn color of California summer grass lands to glowing yellow. It is as though a squadron of

airplanes had passed over, spilling tons of yellow paint, which, after thoroughly staining the slopes had trickled down into the creases below. From the highway it looks as though nothing grew there except *Monolopia* and grass but if you climb up and walk about on the golden carpet, you will see several chalcid species, *Platystemon californicus* (creamcups) and the taller and very lovely lavender-blue *Salvia carduacea* (thistle sage). It is always windy up there and quite impossible to give the long exposure which a filter makes necessary so that, as often turns out when photographing yellow daisies, the darker central ring which with age develops on some yellow coreopsis species and is sometimes imperceptible to the eye, is always accentuated in a *Monolopia* picture.

The genera *Coreopsis*, *Layia* and *Baerea* are the ones to supply the most extensive Californian fields of yellow daisies. *Coreopsis maritima* is an exception for it does not naturally go in for mass effect. If you live by the sea it is easy enough to achieve glowing stands of this daisy by scattering seed on loose, newly disturbed soil and raking it in. Its natural haunts are along the coast of San Diego County and Lower California lying south of it. "Along the coast," is meant to be taken literally here for the succulent two-foot plant often grows on bluffs so close to the ocean that the spray may shower the glistening three and one-and-one-half inch daisies and feathery yellow-green leaves.

Tall, gaunt *Coreopsis gigantea* is also fond of dramatic locations close to the sea and it, too, is limited to the southern coast. The place in which I love to see it best is on a tiny island of rock near to the larger island of San Miguel, the outermost of the Santa Barbara Channel Islands. This gallant plant is al-



Lester Rowntree

Monolopia major

most the only thing growing on the wind swept, wave dashed little spot. In this spectacular setting it holds its thick round bare arms aloft like some prophet predicting doom. After the rains come, each naked angular limb is crowned with a tuft of leaves which very much resemble those of *C. maritima* and in March and April a branched cluster of daisies, similar to but smaller than those of its sister coreopsis, springs from the center of the tuft. Breakers beat, storms rave, winds lash, pelicans swoop, their ungainly pouches wagging, but the sturdy trunk (which may be six inches through), supporting its candelabrum branches, stands dauntless and firm in the noise and loneliness. In cold climates this perennial should not be attempted out doors but *C. maritima*, though a perennial here, has been grown successfully as an annual close

to the Atlantic Ocean where it bloomed when four weeks old.

Of the several other coreopsis,—the annual ones that swarm across the country, some are daintier than others. *C. douglasii*, for instance, makes nice flat, round little plants with thread-like foliage and has wide, flat, bluntly notched rays of soft lemon yellow. Each species has its chosen situation, with soil and exposure to suit its needs.

I think the yellow annual daisy I am most fond of is delicate *Pentachaeta aurea*. For a yellow daisy, it blooms a little late, coming just as the brodiaeas and creamcups go and as the linanthus, which at a distance it somewhat resembles, come on. It grows in the foothills,—in the Yellow pine, Kellogg oak and Incense cedar zone and likes grassy banks at the edge of these woods. The pointed rays are very nar-

row at the base, there is a double row of them round a diminutive center. The slender seven-inch stems branch close to the ground and the charming blooms wave about among grasses and other wild flowers. The gregarious proclivity of some of the clan is not marked in this yellow daisy and it makes a choice annual for the wild flower garden. Whenever I try to describe a flower I am fond of, I feel like a salesman and so make haste to add that I have no seed of *P. aurea* in stock this year.

As I write, mental pictures of many other yellow Californian daisies keep cropping up; a colony of the San Diego

Viguiera laciniata in April,—round-topped, much-foliaged bushes with little sunflower stars above the beautifully wrinkled and wavy-edged leaves; a stand of large-flowered *Wyethia* in August on the lower slopes of Mount Lassen and close to them clean snow banks and the dark boughs of hemlocks. From February, when tall *Geraca canescens* colors the floor of Death Valley, until the *Madias* and *Hemizonias* in the foothills wind up the season, the pageant of daisies, like a slow movie passes across the face of California and as it rolls along, I admit that, after all, yellow daisies have their points.

When Does *Lilium Catesbaei* Bloom

A FIRST COUSIN to our northern Wood Lily (*Lilium philadelphicum*), the Catesby Lily (*L. Catesbaei*), is regarded as a more southern form of it, occurring along the Atlantic and Gulf coastal plains from North Carolina to Louisiana, and through Florida to the Everglades. It is also reported to bloom at the same season, Bailey's Cyclopaedia of Horticulture giving its season as June and July, which checks with the records for North Carolina in the herbarium of the University of North Carolina. But in that same herbarium is a specimen from Kissimmee, Florida, dated September 18—so when *does* this lily bloom? When friends of mine undertook to collect pollen of it for me at Bradenton, Florida, the past summer, they were not able to find any Catesby lilies—locally called tiger lilies—in bloom until the last of September and early in October, which still further extends the season. A check-up in the herbarium of the University of

Florida, at Gainesville, and with Prof. St. John at Floral City, Florida, gave dates through July and August.

There are apparently reports of this lily flowering over a long blooming season, from June to October. The latest bloom is in its most southern extension, along the Florida coast. What is its proper blooming season, and why does it bloom in early summer, in June and July, in the Carolinas, and progressively later southward, until around Bradenton and Naples, Florida, it blooms in October? To try to answer this question, I inquired into its bloom in cultivation. Dr. Albert Vollmer had it in bloom at his home in San Francisco on October 2, 1939. I moved a few in pots from Bradenton, Florida, to Islip, Long Island, last May, and these flowered at Islip, after a typical northern summer, from late September until the last of October, thus agreeing with the time of bloom in their native habitat, bordering the open sandy bogs

in the pine flat woods of southern Florida.

Are there two races of this lily, grading into each other from the North to the South of its range, and will these retain their different blooming seasons, if brought into the same locality? These are questions still to be answered. Meantime, the Southern Florida plants of this lily are now, December 20, in their winter foliage, with groups of oblanceolate, fleshy basal leaves growing from the tips of the new scales of the small, loose-scaled yellow bulbs. The bulbs are about $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter, with basal roots only, and are about two to three inches underground, usually at the base of the tangle of grass roots extending to about this level below ground, in the fine grayish sand. The lilies seem to grow singly, scattered on the moist, grassy flats among sedge, saw palmetto and low herbage. Seldom are there more than two or three of the tiny bulbs together, and all flower stems found have been solitary, each bearing a single upright flower, which ripens its seed in November and December. The seed germinates promptly, but makes only two or three of the basal leaves the first year. How long it takes seedlings to flower is as yet undetermined, but this is evidently the principal manner of increase.

The flowers vary in color, from bright red like the Wood lily to orange, pale yellow and even white. The usual

color is red, with a yellow center, bearing large brown spots, as large and conspicuous as those on *Lilium pardalinum*. An albino of this lily has been found here by Dr. B. G. Arnold, with flowers nearly pure white, with only a faint creamy tint, and faint creamy instead of brown dots near the center of the flower. White-flowered forms are rare in the upright-flowered group of lilies.

Because of its unusual blooming season in the late fall and the usually bright color and attractive form of its tapering-petalled, large upright flowers, this lily is well worth cultivating, but has proven difficult to manage, even in mild climates. It is not very hardy, and is suited only to pot culture in regions with frozen soil in winter. Its main requirements seem to be a very loose, acid sandy soil with some acid leaf mould in it. During its long growing season, which extends through most of the year, it requires both abundant moisture and perfect drainage. Judging from a few successful experiments with it here, it should be moved in late fall or early winter, after the flower stalks have died back, and before the winter rosette of leaves is too far advanced. If moved at the right time, it forms a good new set of roots before the flower stalk starts growth, which is in late May or early June, with the southern Florida plants of this lily.

Bradenton, Florida.

The Longevity of Plants

ROBERT M. SENIOR

IN RECENT YEARS the longevity of plants, flowers and seeds has been subject to considerable investigation. Of two related species why should one be much longer lived than another? Why, for example, should the relatively small Cornelian Cherry (*Cornus Mas*), frequently live over 150 years, whereas some tall species of maple seldom attain an age of more than 100 years? Similarly, why should certain flowers remain fresh for days, whereas others will wither in a few hours? Again, why do some seeds retain their viability for years, whereas others must be planted at once, in order to assure germination?

In a book entitled "The Longevity of Plants," Dr. Hans Molisch endeavors to answer some of these questions. In the course of his investigation, he had occasion to ascertain the age of many trees, shrubs and herbaceous plants. For example, he mentions the Sequoias as being the oldest trees in our country, frequently reaching an age of 4,000 to 5,000 years. Among other evergreens, the Cedar of Lebanon sometimes attains an age of 1,200 years, the Swiss Pine 700 years, and the Scotch Pine 500 years.

Most of the deciduous trees have a shorter life than the evergreens above mentioned. And yet the tree rings of a certain elm indicated that the tree was about 600 years old. In another instance a hawthorn, *Crataegus oxyacantha* lived over 300 years.

Among the bulbous and herbaceous plants, we seldom find any living beyond a half century. And yet it is asserted that a fair number of plants reach ages approximately 30 to 40 years. For example, it has been def-

initely reported that the heather, *Calluna vulgaris*, has occasionally attained an age of over 40 years. I daresay some who read this article may have plants in their garden that have attained an advanced age. Possibly the readers of this magazine might be interested in learning about such plants.

What are the factors that tend to produce long lived perennials? Possibly many might be inclined to associate longevity with size or height. It is no doubt true that trees live longer than herbaceous plants. But size cannot be the chief factor governing longevity. We have mentioned the low growing *Crataegus oxyacantha*, living over 300 years. Similarly, a low growing herbaceous plant may far outlive a tall growing plant.

The greatest factor conditioning the longevity of plants apparently is determined by its reproductive capacity,—in other words, by the earliness, quantity, and frequency of the seed bearing process. It is interesting to note that a somewhat similar phenomenon is observed in the animal kingdom. The insect that is born, and bears numerous offspring, all in the same year, dies in a comparatively short time thereafter. Vice versa, man is born only after the parent has passed a long period of youth and adolescence. Similarly, the annual plant bears huge quantities of seed, and shortly thereafter perishes. The biennial develops vegetative growth the first year, and dies the second year after bearing seed. Sometimes a monocarpic plant continues in the leaf stage for several years: but it too dies after it flowers and seeds. One of the longest lived perennials in my garden is a hybrid that bears no seeds at all.

Generally speaking, trees delay their fruiting period until they attain a considerable age. On the other hand, most peach trees bear at an early age, and are relatively short lived.

It is for the reasons above mentioned that gardeners who want to keep a plant in vigorous condition, are urged to cut the flowers as soon as they begin to fade. Similarly advice is often given to use fertilizers after a plant seeds, in order to restore some of its vitality.

What causes some flowers to live much longer than others? One or two factors have been observed. For example, a flower bearing many stamens, as well as considerable pollen, will generally be more short lived than one with many stamens. The poppy is an example of a flower with numerous stamens. "You seize the flower, its bloom is shed." On the other hand, many orchids, bearing only one fertile stamen, remain fresh a long time.

Might we draw the conclusion from a study of flowers, that plants bearing a few blooms, should keep these fresh longer than plants bearing a multitude of blossoms? Probably such a sweeping conclusion would hardly be valid. I have in mind the profuse flowering asters and chrysanthemums that remain in bloom a long time. However, I have observed in some instances, that of two

plants of the same species—one bearing many flowers, the other very few—that of the two, the latter seems to bear its flowers longer.

Some interesting observations have been made on the longevity of seeds. Of course all of us know that certain seeds, such as the primrose, lose their viability very rapidly. On the other hand, it is related that at the Jardin des Plantes, in Paris, they came across a few packets of seed that had been stored in some nook, and had been forgotten for over thirty years. When planted, a large percentage germinated. I also remember the story of the Swiss horticulturist Correvon, who stated that a gentleman planted outdoors some seeds that he knew were slow to germinate. Their position on his grounds was marked by a stake. Eight years later these seeds germinated. Possibly the most remarkable report on the viability of seeds is that relating to the Indian Lotus (*Nelumbo*), which experts estimated had been buried in peat beds for fully 60 years. When the hard seed coats had been filed, the seeds were planted, and germinated in four days. On the other hand, the story of the wheat seeds that were found in Egyptian tombs, and which germinated when planted is without any foundation of truth.

A New Commercial Oil Palm in Ecuador

O. F. COOK

OIL-BEARING palm-kernels from Ecuador, representing commercial shipments, were brought recently by my colleague Dr. George S. Jamison for botanical identification. Earlier samples of such kernels had remained unnamed, but now associate with herbarium material of a new genus, one of the large forest palms to which the traditional names *Attalea* and *Maximiliana* have been applied, but with several characters not previously known. The new palm may prove important as a natural resource, and worthy of domestication as a food and fiber crop. In many tropical regions tillage agriculture with field crops is not feasible, but permanent systems of tropical agriculture may be developed with palms and other tree-crops.

All of the commercial oil palms are members of the coconut family, the largest and most diversified group, with hundreds of wild species in South America. The babassu palms of Brazil, *Attalea speciosa* and related species, are reported to cover wide areas in Maranhao, and the kernels are reaching the United States in substantial quantities, replacing Oriental palm-oils. Three of the cocoid palms have been domesticated. The coconut, *Cocos nucifera*, now widely cultivated, is not known in the wild state. The so-called "African oil palm," *Elaeis guineensis*, is reported to grow wild in Brazil, and may have been carried to Africa in early colonial times. Its history was reviewed in THE NATIONAL HORTICULTURAL MAGAZINE, January, 1940. The third domesticated type is the chonta or chontaruru palm, *Guilielma speciosa*, with edible fruits. This probably was an ancient culture, since many seedless

varieties are grown among primitive tribes, from Brazil and Bolivia to Costa Rica.

An outstanding feature of the new palm is the enormous pendent cluster of fruit, like an over-size "bunch" of bananas, shown in figures 1 and 4. The individual fruits are less than two inches long, but great numbers are massed together, the entire cluster estimated to weigh 250 pounds, "too heavy for two men to lift." The fibrous husk is thin and readily removed, leaving a smooth, oblong nut similar to a pecan, but with three "eyes" at the base like a small coconut, and a large central cavity filled by an oval kernel. The assay of the kernels in the Bureau of Chemistry showed 51.74 per cent of oil and 4.28 per cent of moisture.

The single colossal fruit-cluster is in notable contrast with smaller and more numerous inflorescences in the better-known oil palms, as *Elaeis*, *Alfonsia*, *Temenia* and *Bornoa*. A notable saving of material in peduncles and enveloping spathes may be reckoned. The inflorescences of the other genera not only are relatively small, but very compact, the clusters so crowded that many of the fruits are dwarfed or deformed by the mutual pressure, with resulting irregularity in the sizes and shapes of the nuts, so that cleaning and cracking are rather difficult and wasteful. Such pressure and distortion are avoided in the new palm by a marked elongation of the basal joint of the branches of the inflorescence. The specialized branches, the large size of the cluster, and the long peduncle, are three features that tend to facilitate mechanical harvesting and extraction of the kernels. The short-stalked fruit-clusters of *Elaeis* are

closely wedged among the indurated leaf-bases, and gathered with difficulty. Also in *Bornoa* the fruit cluster is very compact and is covered by the remarkably thickened spathe. A planting of *Bornoa* is projected in Haiti, since the nuts are of excellent quality, but they may need to be gathered from the ground.

NAMING THE NEW PALM

The plant material of the new genus was collected by Mrs. Ynes Mexia at the hacienda Santa Lucia, Canton Vinces, Distrito Los Rios, in the coastal plain of Ecuador, October 20, 1934, No.6574. A section of the trunk is included, margins of the leaf-sheath, sections of the midrib with attached pinnae, branches of the inflorescence, and nearly mature fruits. The male flowers are not represented. The local name was *palma real*, meaning "royal palm," and possibly is distinctive in that district, but is shared in other Spanish-speaking countries with several large palms, *Roystonea*, *Jessenia*, *Cocos*, *Attalea*, and *Scheelea*.

In addition to the photographs associated with these specimens, three others are labeled "*palma macora*, not collected." These apparently represent the same palm, and are reproduced in figure 1, a mature palm at the upper right and a young palm below, showing the trunk beset with remains of the coarse leaf-sheath fibers, which may have suggested an *Astrocaryum* or other spiny palm. The name *macora* apparently has not been recorded, but possibly is a variant of *mapora* associated in Karsten with a palm from Colombia, *Oenocarpus mapora*, not of the coconut family. Local variations in forms and applications of names are not infrequent, and entirely erroneous "*informes*" may be furnished by town-dwelling natives who go out as "guides" for travellers.

The name *Ynesa colenda* is suggested for the Ecuadorean *palma real*, to commemorate the work of Mrs. Mexia, a woman with unusual interest, energy and courage, who devoted her later years to extending our knowledge of the plant world of tropical America. The many difficulties of getting large palms felled and dissected in the forest, making measurements, taking photographs, writing notes and preparing specimens, usually are avoided. Nobody before Mrs. Mexia had taken the trouble to bring home good palm material from Ecuador or from the neighboring regions, which have the richest palm flora in the world. Even the ivory palms, which usually are confined to the darkest and wettest forests of the Andes, were not disregarded by Mrs. Mexia. Some of the difficulties she encountered in obtaining photographs of large forest palms in Ecuador are stated in a letter written at Quito, June 13, 1934:

"I regret that so many of my photographs of the palms are so poor, but the difficulties in photographing them are terrific. The palms are generally in dense forest, which shuts out almost all the light, and added to that, the weather is almost always cloudy, while the humidity is high. Often it is misting or raining in these tropical forests. The palms are so big and the surrounding vegetation so thick that one can get no chance even to see them. I have sent some very poor photos, which I would have preferred to omit, but I thought they might give some wanted indications or habit."

The last expedition undertaken by Mrs. Mexia was in Oaxaca, where a fatal illness was contracted. A biographical notice by Mrs. H. P. Bracelin appeared in *Madroño*, 4:73. October, 1938.

Under the forest conditions it often

is difficult to find a palm that can be felled without cutting other trees and losing too much time. The large kinds of forest palms produce no flowers or fruits until they grow above the forest canopy and reach the sunlight. Many large types are excluded from deep forests, and restricted to areas where the forest growth is somewhat open, on account of poor soils, dry climates, or long periods of flooding that limit the growth of other trees. The smaller forest palms are more tolerant of shade, and complete their development as undergrowth. Much of the forest vegetation is remarkably localized, to an extent that has not been appreciated.

CHARACTERS OF YNESA

A mature palm attains, according to Mrs. Mexia's notes, a height of 125 feet and a circumference of five feet, above the sloping mass of superficial roots at the base of the trunk, as shown in figure 2. The trunk is remarkably columnar, somewhat narrowed when the fruiting stage is reached, but probably less than indicated in figure 1, since allowance should be made for foreshortening. The superficial roots of the palm are somewhat more slender than those of an epiphytic aroid partly cleared away in figure 2, but shown in another photograph. The leaf scars in figure 3 are closely crowded, less than one cm. apart, longer on the petiole side to 5 cm., the surface distinctly convex, pitted with the sockets of coarse fibers. The "bark" is said to be "blackish" on the outside, but the indurated surface layer is dark brown, the interior a light straw color. The section shown in figure 3 probably came from the upper part of the trunk where the leaf scars doubtless are more crowded than near the ground, as faintly indicated in figure 2. The notch at the left of the section in figure 3 may mark the attach-

ment of an inflorescence. The leaf-base measured nearly seven feet, the margins fringed with curved, wiry fibers about 3 mm. thick at the base, shown at the right in figure 4. The fibers taper in three or four feet to slender threads.

Leaves 16 to 20, in a spreading crown, the midribs 28 feet long with 150 pinnae on each side, rather evenly placed along the rachis, except that the basal pinnae are narrow and close. Pinnae at one-third of the leaf-length, 4 to 5 cm. apart, attaining 135 cm. by nearly 8 cm., the greatest width about 50 cm. from the base; pinnae at two-thirds of the leaf length, 145 cm. by nearly 9 cm.; attachment of pinnae to the midrib nearly vertical, oblong, 2 cm. high, 1 cm. wide, the lower margins incurved, nearly closed, midribs of pinnae projecting above the blade as a sharply angled, corneous flange 4 mm. high, 2 mm. thick, of extremely firm texture, bordered on each side by a narrow furrow fretted with minute cross veins, forming a hinge between the midrib and the submedian veins, these slightly thickened below, lying against a very narrow inferior flange of the midrib. Upper surface of pinnae smooth and shining in the fresh state, the lower dull green. Texture of pinnae firm, rather closely veined, the slightly more prominent veins 3 to 6 mm. apart, cross-veins indistinct, marginal vein strongly developed, prominent on both sides. Since the pinnae, if opened flat, would require about twice the space that they have on the rachis, they doubtless remain permanently folded. The stomata appear whitish, in numerous close rows between the veins of the lower surface.

Basal pinnae greatly reduced, less than 1 cm. apart, the lowest pinna 70 cm. long, less than one cm. wide, fifth pinna slightly longer, 1.7 wide; texture



Fig. 1. Ynesa palms, mature and juvenile

of lower pinnae thinner, and the cross veins more distinct, crossing the midrib and the submedian veins. Base of rachis 9 to 10 cm. wide, the margins rather thin, the basal pinnae inserted below the margin, the attachments narrow, to to 6 mm.; rachis convex in the middle above, prominent below, about 3 cm. thick, the lower surface nearly flat, with a firm brown tomentum. Apical pinnae gradually reduced 3 to 4 cm. apart; fifth pinna before the last 62 cm. by 2.5 cm., terminal pinna 51 cm. by 1.4 cm.; rachis narrowed to less than 2 mm., percurrent as a slender bristle 40 cm. long.

Only the inner spathe was noted by Mrs. Mexia, as nearly 10 feet long, "3 yds., 7 in.," but the outer spathe can be seen in figure 5, about one-third as long as the inner and notably broader, the lateral margins thin and the end torn into fibers. The inner spathe is said to have been "very hard and woody," and the slender, tapering form is in marked contrast with the short, thick, deeply plicate spathe of *Bornoa*. The peduncle appears to have been about three feet long, and two or three inches in diameter. A "slender dry stalk" also was noted as probably bearing the male flowers. "Natives claim that this palm produces a cluster of male flowers one year, and of female flowers the next, thus fruiting in alternate years."

The fruit cluster appears to have been about five feet long and fifteen to eighteen inches in diameter. The number of branches was very great, probably in hundreds, with 8 to 10 fruits on each branch of those collected. Two of the fruiting branches are shown in natural size in figure 5, with fruits, nuts, and sections. The long, naked base of the branch is a specialized feature not shared among the related genera, *Bornoa*, *Ethnora*, and *Temenia*.

The mature perianth covers only the base of the fruit, less than a third of the total height. The sepals are markedly narrower than the petals, but nearly as long. The staminal cup, also shown in figure 5, is relatively large, nearly equal to the petals. The mature perianth is much smaller than in *Ethnora*, where half of the fruit is covered, although relatively large, 7 cm. by 3.5 cm. The female flowers are subtended by a broad acuminate bract and three thinner mucronate bracteoles, the upper bracteole sometimes larger and more prominently angled, resembling a sepal.

The dry fruits, said to have been not quite mature, attain 4.5 cm. by 2.2 cm., with the pericarp only 1 to 2 mm. thick, the nuts 4 cm. by 2 cm., the cavity 2.3 cm. by 1.4 cm., the walls 2 to 3 mm. thick. The nut is oval with a stout conic rostrum projecting 7 to 8 mm. above the cavity, ending in three small tubercles. The surface of the nut is finely grooved and ridged with slender, longitudinal fibers, impressed or adherent, while the nut of *Bornoa* is smooth to near the base. Cross-sections show one or both of the abortive carpels with the lumen much broader than in *Bornoa* or *Ethnora*. One of the kernels in figure 6 is flattened, showing that two carpels sometimes develop. The kernels in this commercial sample from Esmeraldas are 2.5 to 3 cm. long, 1.5 to 2 cm. wide, the testa prominent and closely plicate along the raphe, the remaining surface with an open, irregular network of coarser and finer grooves, shown in figure 6 in comparison with much narrower and smoother kernels of a babassu palm from Brazil. The basal embryo is distinctly prominent, more than in the babassu kernels, and the endosperm has a softer and more open texture, so that greater care in storage or shipment may be needed.

The immature fruits were described



Fig. 2. Base of Ynesa palm in forest

by Mrs. Mexia as "dull green," turning orange at maturity, with a light yellowish "gummy" flesh, which doubtless is similar in texture to the oily pulp in many related palms. The pulp oil is different from the kernel oil in color, taste and other properties in all of the economic species, and in the African oil palm is much more important than the kernel oil.

The district where the palm was collected had an altitude of 150 feet, and a six-months dry season. The palm is said to be common, but growing scattered in dense forest. A wider distribution is indicated by kernels being shipped from different ports, Guayaquil, Manta, and Esmeraldas, as shown by commercial samples. Local variations may be found when palms of different districts are compared, unless the type has spread through human agency in recent times, like *Elaeis* in West Africa.

Illustrations of two genera related to *Ynesa* have appeared recently, *Bornoa* in THE NATIONAL HORTICULTURAL MAGAZINE, October, 1939, and *Ethnora* in the *Journal of the Washington Academy of Science*, July 15, 1940. The ample female inflorescence of *Ynesa* is in marked contrast with short, compacted inflorescences in *Bornoa* and in *Temenia*, a Brazilian genus originally described and illustrated by Martius under the preoccupied name *Maximiliana*. In *Ethnora*, the palm known as maripa in Guiana, the inflorescence is less congested but the branches are not stipitate as in *Ynesa*. Also *Ethnora* has the endocarp crassate, the foramina superficial, and the endosperm narrow. The female perianth is very large in *Ethnora*, sheathing the fruit to above the middle, but is very small in *Temenia*, and only moderately developed in *Bornoa* and *Ynesa*.

A RECORD OF *Ynesa* IN 1789

An early record of palms in Ecuador apparently has been overlooked in compiling some of our reference works, a chapter in Velasco's "Historia del Reino de Quito," printed at Quito in 1844, but written in 1789. Velasco had information of more than fifty species of palms, and mentions about thirty of the more important kinds with their habits and uses. Spanish names are given in a few cases but most of the names are from indigenous languages. Most of Velasco's names have been reported by later writers and are included in Dahlgren's list, but some may be no longer in use. The later reports are not in all cases from Ecuador, but from Colombia, Brazil or Peru.

Instead of fifty or even thirty palms from Ecuador, Dahlgren mentions only 22 species as actually reported by botanists. Several species of ivory palms illustrated and named by Gaudichaud, probably from Ecuador, are not included. (Velasco's *palma real*, described as a mountain palm with flexible lustrous leaves, generally used in Holy Week celebrations, would not correspond to the type obtained by Mrs. Mexia. The leaves of *Ynesa* are too large, heavy and rigid to be convenient for decorative use.

The palm that Velasco associated with the name *sapaja* or *shapaja* seems to have represented *Ynesa*. It is listed among the coconut palms, *palmas de cocos*, and noted as very tall, also as furnishing the best fiber for brooms. The bases of the leaves are said to be so hard and fine that arrows are made of them, and they are worked into combs like tortois-shell or ivory. The large clusters are mentioned, and fruits the size of hen's eggs, as would result from the pulp thickening at maturity. The kernels are described as "very rich

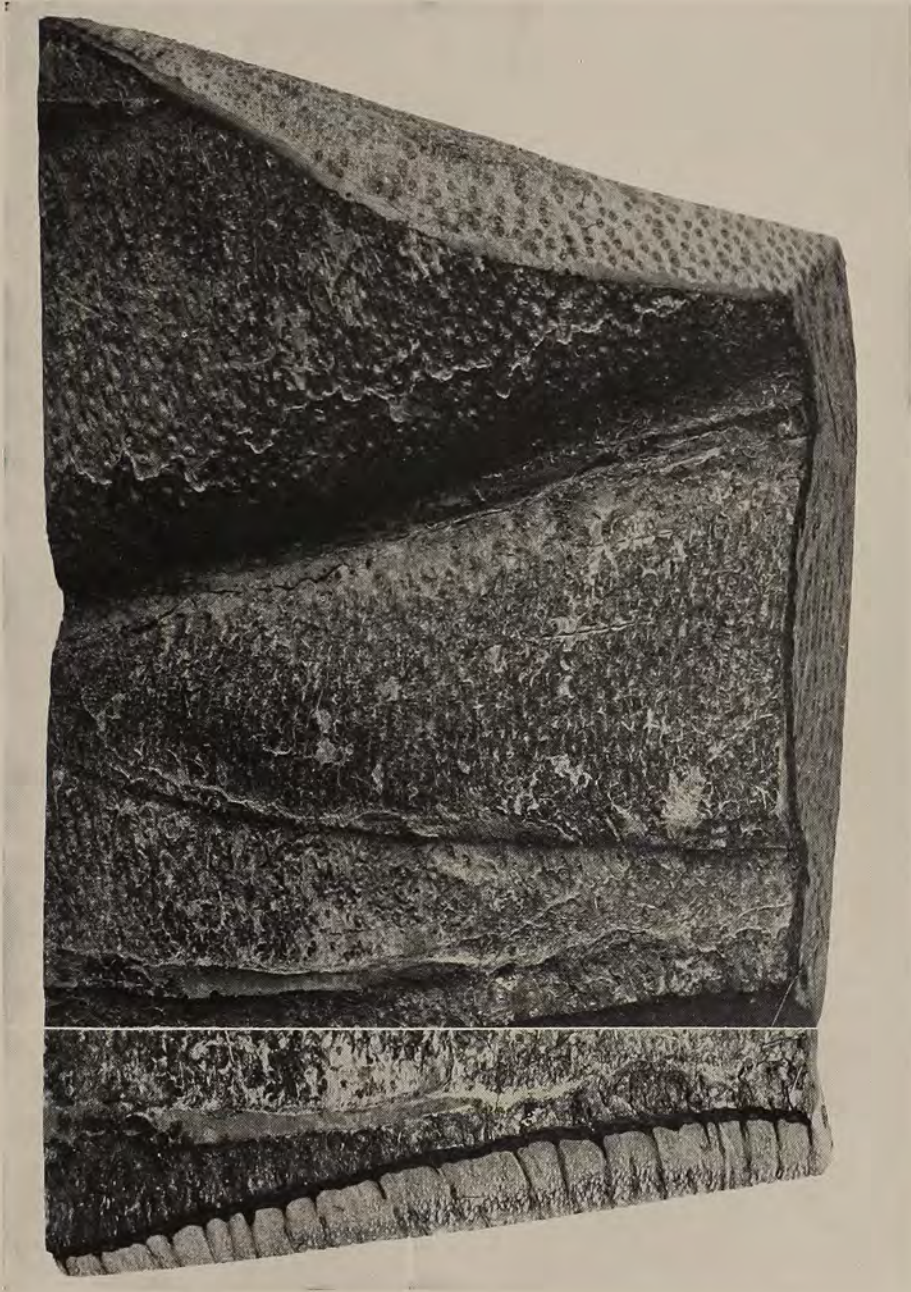


Fig. 3. Trunk section showing leaf-scars, natural size

pine nuts like those of the pine tree," an apt comparison for the texture of the endosperm, and the taste doubtless is sweet and pleasant in the fresh state, as in *Bornoa* and *Ethnora*. The surface of the fruits is said to be irregular and variously wounded, suggesting attacks of birds or insects.

YNEsa RELATED TO A FIBER PALM

Another type that appears to be definitely related to *Ynesa* is the Brazilian palm described by Martius (2:136) more than a century ago as *Attalea funifera*, a species widely known as the original source of piassava, a coarse, rigid fiber used extensively in Europe and in the United States for brushes, brooms and street-cleaning machinery. Similar fiber material has been obtained from *Leopoldinia* and several other palms not related to *Attalea* even as members of the coconut family, but *Ynesa* is a cocoid palm with a fiber closely resembling the original Brazilian *piassava*.

The similarity of the fiber does not mean that *Ynesa* is closely related to the large series of palms that have been described under the name *Attalea*, but that the fiber-bearing species, *Attalea funifera*, is widely different from most of the others, although its generic assignment apparently has not been questioned. The reason may be that the piassava palm has a large, oval nut very similar in general appearance to the babassu nut, but in structure not alike. The resemblance will appear as another example of parallel evolution, after the differences are appreciated.

Martius noted a peculiar feature of the nut of *Attalea funifera*, that it is marked on the surface by three longitudinal grooves. These grooves are significant of the fact that the structure of the endocarp is essentially different from that of the babassu nut and the

many related forms that have the endocarp reinforced by an indurated layer of mesocarp fibers, fused and incorporated with the endocarp. Lacking this fibrous layer, the endocarp of the piassava palm is of uniform texture, as in *Ynesa*, *Bornoa*, *Temenia* and *Ethnora*, but the thickness of the uniform layer is much greater. The grooves that Martius noticed mark the sutures between the carpels as not completely closed, nor covered by fibers. Some of the mesocarp fibers are attached at the base of the piassava nut, but are not incorporated.

The uniform texture of the endocarp as well as the remarkable fibrous structure of the bases of the leaves require an association of the piassava palm with *Ynesa* and the related genera, so that other similarities and differences may be noted. *Sarinia* is suggested as a generic name for the piassava palm, in allusion to the chief use of the fiber for making brooms and brushes, with *Sarinia funifera* (Martius) as the type species. Notable differences appear in specimens of the nuts, which may represent local races or subspecies. Burret has described a trunkless palm as a distinct species, *Attalea acaulis*, but Bondar considers it not distinct from *funifera*.

CHARACTERS OF *Sarinia*

A detailed account of *Attalea funifera* is included in a paper by Gregorio Bondar, "Palmeiras do genero *Attalea* e sua importancia economica," published in "O Campo," October, 1938. A photograph shows the palm, much smaller and more slender than *Ynesa*, the leaves mostly erect or ascending, with rather short, drooping pinnae, not in regular alignment along the rachis as in *Ynesa* but set at different angles, in separate "interrupted" groups, the arrangement that appears in *Temenia* but not in *Bornoa* or *Ethnora*. The

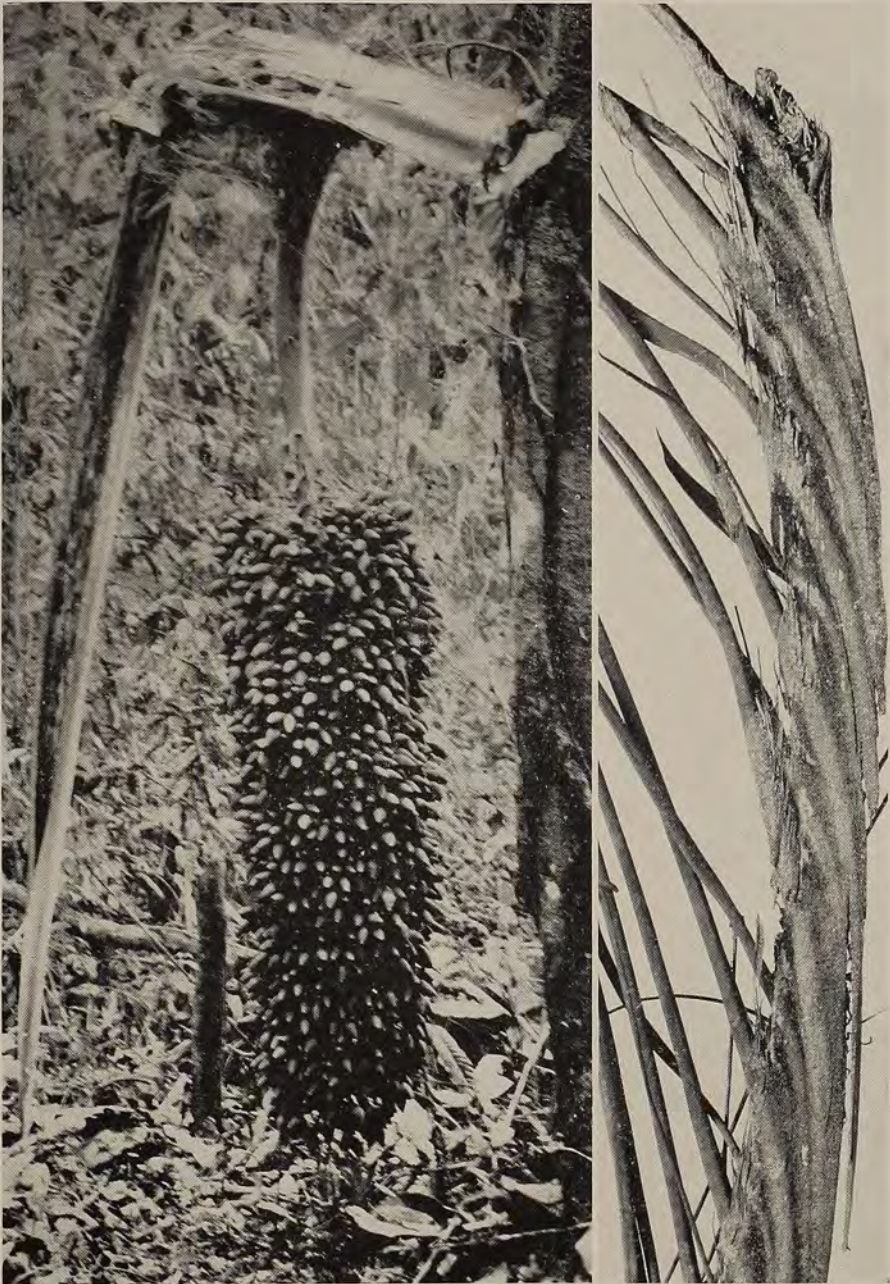


Fig. 4. Fruit cluster of Ynesa. Fibers of leaf sheath, natural size

pinnae are only 50 to 60 cm. long, and 4 to 5 cm. wide, the upper pinnae reduced to 20 cm. The fibrous margins of the petioles are considered as a special feature of this species. The trunk is 6 to 10 meters tall, 25 to 30 cm. in diameter. Martius described the leaves as 15 to 20 feet long, the pinnae as 3 feet long.

The inflorescence of *Sarinia* has the branching axis only 50 cm. long, the branches 10 cm., with only one or two female flowers. The male branches are described as remotely scrobiculate on one side, with two flowers from each pit; the male flowers are more than 20 mm. long, petals 4 to 5 mm. wide, flattened at base and apex, the stamens 8 to 9 mm. long, anthers sagittate-linear, with short filaments. The fruit is much larger than in *Ynesa*, 10 cm. by 5 to 6 cm., ovoid, the apex more acute than in *Ynesa*, the basal quarter covered by the perianth, the sepals broad, nearly equal to the petals, the staminal cup large, the margin notched. Nuts in the seed collection of the U. S. Department of Agriculture measure 9 cm. by 5 cm., others smaller, to 5 cm. by 3.2 cm. All are distinctly rostrate with the three intercarpellary groves very distinct. Three carpels may be fertile, but usually two or one, the kernels then attaining 4 cm. by 1.8 cm.

Regarding the fiber of the piassava palm, Martius reported that a length of twelve feet was attained, while the leaf base was noted as four feet, so that a very long antiligule is indicated, eight feet or more. The name antiligule is given to a special structure of the leaf-sheath only recently recognized, forming an upward projection of the rim of the leaf-sheath on the side opposite the attachment of the leaf-blade. An example of an antiligule represented by a fringe of stiff spine-like fibers was illustrated in this *Magazine* for January,

1941, in a Haitian fan-palm, *Oothisax anomala*, but the antiligule in that case is only a few inches long.

The fibers that emerge from the margins of the leaf-base of *Ynesa*, shown in figure 5, are only three or four feet long, but those of the opposite side of the leaf sheath, where an antiligule would be developed, may be much longer. The leaf base is longer in *Ynesa* than in the piassava palm and the leaf-base fibers may be more regular than those of the antiligule. As in other specialized characters, much variation may be found. Selection should be directed to differences in the fiber as well as to the characters of the inflorescences, fruits, nuts, and kernels, if the domestication of the palm were attempted. The fiber may be only a by-product or might prove more remunerative than the oil, and would be obtainable from the young palms before the fruiting stage. Harvesting the leaves for fiber might facilitate the harvesting of the fruits. The fibers of the peduncle, the axis and the branches of the fruit clusters may also be utilized as by-products.

THE ENDOCARP A THREE-FOLD STRUCTURE

A new structural element was indicated in describing the endocarps of *Bornoa* and *Ethnora*, a core or matrix forming the center of the nut, the partitions between the carpels, and the sutural bands, which in many of the cocoid palms are marked distinctly on the surface of the shell. The matrix may be considered morphologically as a placenta, an axial organ, a modified metamer, or an intercarpellary specialization of the compound endocarp. In many members of the *Attalea* series the matrix is more or less definitely outlined in cross-sections by rows of longitudinal canals along the radiating



Fig. 5. Ynesa palm, fruits and fruiting branches, natural size

flanges that separate the chambers of the nut, where two or more carpels are fertile. The relation of the matrix to the sutural bands was first recognized in describing the endocarp of *Ethnora*.

The sutural bands of *Ynesa*, less distinct than those of *Ethnora* and *Bornoa*, are marked on the surface of the nut by only a slight striation, and in the cross-section by a few fibers forming a triangle. At the apex of the nut the sutural bands become prominent but are completely fused with the carpels, forming a conic rostrum about 5 mm. long. The rostrum terminates in three tubercles surrounding a central depression with the underlying tissue not indurated, as shown in one of the longitudinal sections of a nut in figure 5.

A third element of the endocarp, wanting in *Ynesa* and related genera, but highly developed in *Attalea*, *Orbignya* and *Scheelea*, is an outer shell apparently formed from a layer of mesocarp fibers, indurated and fused with the inner endocarp and the sutural bands. This fibrous reinforcement often is much thicker than the uniform layer underneath, which doubtless represents the true endocarp. The nuts of some of the species of *Attalea* and *Orbignya* have shells 6 to 10 mm. thick, with only one or two millimeters of uniform tissue near the chamber wall. Even in small-fruited members of the *Attalea* series, the preponderance of the outer fibrous sheath over the uniform inner layer usually is maintained. An exception appears in the "palma real" of Colombia, described by Karsten in 1856 as *Scheelea regia*, which may be considered as the type of that genus. The nuts are small like *Ynesa*, and the shells of nearly the same thickness, but less than half of the shell showing fibers in the cross-section. The Brazilian genus *Pindarea*, with rather small thin-shelled

nuts and superficial foramina, may prove related to *Ynesa*.

The great thickness of the true endocarp in the nut of the piassava palm, attaining 10 to 15 mm., is a marked feature of the new genus *Sarinia*. An approach may be seen in *Ethnora*, with the endocarp about twice as thick as in *Ynesa*, *Bornoa* and *Temenia*, but *Ethnora* has superficial foramina while those of *Sarinia* are on the inner face of a deep cavity. The embryo of *Ethnora* projects from the endosperm into the canal leading to the foramina, while the embryo of *Sarinia* is not prominent. The shells of *Sarinia* often split along the grooves, where the flanges of the matrix are near the surface, as though the matrix tissue were more friable. The canals of the matrix of *Sarinia* are somewhat scattered through the tissue, rather than forming peripheral lines as in *Ethnora*.

PROBLEMS IN THE STUDY OF PALMS

Palms admittedly are a difficult group for making herbarium specimens, and have received less study on that account, but plants of many other families have structural features that are not reducible to the herbarium compass of two dimensions, and are disregarded through this limitation of herbarium methods. The "gross anatomy" of plants, the "vegetative characters," are in special need of being studied, described and contrasted, so that the different forms and habits of different types of plant life can be recognized in nature or in cultivation, such recognition being the first requirement for further study. Only by taking account of the external, visible features of plant life can the study of botany attain its proper place among our normal interests and satisfactions.

It is hardly too much to say that the Iinnacan "sexual" system of classify-

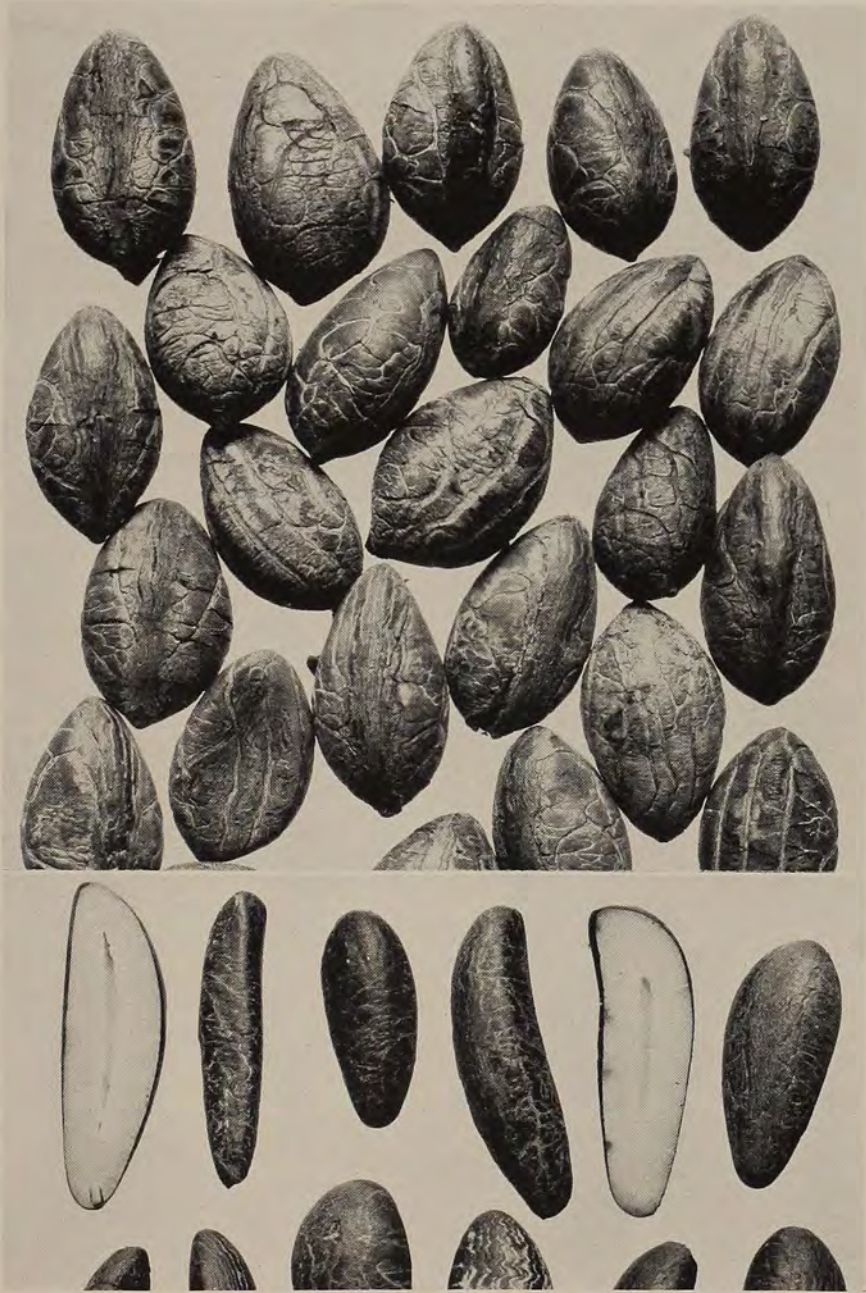


Fig. 6. Ynesa kernels from Ecuador and babassu kernels from Brazil, natural size

ing plants, by focusing attention so exclusively upon details of floral structure, often minute, temporary and difficult to interpret, has tended to narrow the range of public interest and to limit the study of botany to those working professionally with herbarium collections. The curatorial function is important, but an exclusive relation to the study of plants should not be assumed, lest our natural interest in the plant world be aborted and pushed aside. Botany often is reflected in general literature, not as the science of plant life, but as a rather trivial art of "naming flowers." A philosopher like Santayana, with a wide outlook over human interests, dismisses the botanist as "only a professor."

The state of knowledge and interest in extra-floral specializations was tested thirty years ago in describing a series of remarkably contrasted habits of branching in several well-known plants that receive intensive study in many countries. A paper was published in 1911 as a Bulletin of the Bureau of Plant Industry, No. 198, under a sufficiently explicit title, "Dimorphic Branches of Tropical Crop Plants: Cotton, Coffee, Cacao, the Central American Rubber Tree, and the Banana." The experience of discovering these specialized habits of growth and demonstrating various applications to cultural and breeding problems has made it plain that little approach to this aspect of plant life is provided in current text-books and courses of training.

With no thought of depreciating the interest or significance of the floral specialization, it may still be asserted that the vegetative specializations are not less interesting or important in plant evolution or in plant utilization. That a palm should reduce its annual crop to a single inflorescence, as appears to be the case with *Ynesa*, instead of the

several inflorescences usually produced in related genera, is not less remarkable than that some of the stamens or petals should be modified. The inflorescences of palms often are more specialized than the flowers, and in other cases the leaves, the trunks, the seedlings or the seeds present significant differences. All of these features are much more accessible to observation than the flowers, which may be limited to a week, or even a day. Instead of wider interest and broader methods of botanical work being planned, further limitations are projected, as though plants were to be named without being studied, except to the minimum of assigning conventional floral characters.

This is the tendency of rules proposing to restrict the naming of plants to herbarium specialists, and to a limited class of such specialists, those proficient or reckless in writing Latin descriptions of plants, according to the medieval customs still followed in some of the European countries. The requirement of Latin diagnoses would place botany on a different footing from other biological literature, and create many needless difficulties, since in any English description of a plant most of the contrasting differences are stated in Latin or Greek words, which the English language readily incorporates. The diagnostic characters of *Ynesa*, for example, the elongate inflorescence, rostrate endocarps and excavate foramina, are scarcely different in Latin: *inflorescentia elongata, endocarpia rostrata, foramina excavata*. The genus *Sarinia* is characterized as clearly by long fibers, interrupted pinnae and uniform endocarps as by *fibris longis, pinnis interruptis, endocarpis uniformibus*.

No practical or scientific reason has been shown for placing a handicap on the study of plants in English-speaking countries where the classical languages

are giving way to the plea of making education more scientific. Even for would-be botanists Latin without Greek offers limited advantage. Latin botany began with translations of Theophrastus and Dioscorides, and the borrowing of scientific terminology from the Greek language has continued through the centuries, in English as in Latin. Any Latinist who knows botanical terminology can read plant descriptions in English. Technical botany is not classical Latin or classical English, but a special jargon, not to be venerated, but rather to be escaped. Making botany more esoteric is not a scientific object, nor an aid to human progress. The demand that science become more widely intelligible is being urged for reasons of national welfare. "For the public must, first of all, be informed about science if research is to be preserved."

An enforced linguistic uniformity must remain a dubious project, with patriotic people often impelled to describe their native plants in their native language, regardless of foreign experts. A zeal for formal regulation of botanical literature might be exercised more constructively by providing that new types of plants be made known through adequate illustrations, which can be interpreted in any language. The art of photography makes it possible to have natural-size reproductions of essential features for direct comparison, like actual specimens. A single illustration showing details of a new type, like the branches and fruits of *Ynesa* in figure 5, permits a definite recognition of the palm, which elaborate descriptions may fail to accomplish. The notion of botany being based primarily on definitions has made it a sterile "study." All of the study is futile that does not deal with visual impressions. The eye

is the primary organ, not the faculty of logical formulation.

The further development of systematic botany needs to be studied from the standpoint of education. The system of classification of plants and animals is the greatest structure of thought that the human mind has erected, but left in a state of forbidding technicality. No other system in science, philosophy or law deals with such an endless array of forms and concepts, organized by so many constructive intellects. Botany is a field of unlimited interest for "the independent activity of the human mind," but some would have it closed and barred. "All literature has its conventions," and botany is intensively formalized.

The diversity of living forms is a basic fact that the public intelligence must assimilate, if our system of civilization is to reach a truly constructive consciousness. A world of one kind of plants is unreasonable, or a world of one kind of people. The notion of human welfare as a state of uniformity is one of the statistical delusions that attend the exploitive dominance of the physical sciences in our present world, and are plainly destructive. Many moralizing expedients of controls or leaderships are being contrived by benevolent specialists without appreciating that nations of scientific people are needed to appreciate and apply science. Only by way of interest in the plant world is it possible to project the rural renaissance which obviously is necessary if our system of civilization is to be maintained. It is not enough that herbarium collections be supported, or public gardens; our primitive birth-right of interest in living forms must be recovered and developed.

About Lilies

VIOLET NILES WALKER

SUCCESS with the scale bulb lily depends primarily upon some understanding and analysis of its history, for no other plant family has experienced such definite extremes of popularity and neglect, with corresponding fluctuations in cultural theories. And with no other flower has successful cultivation depended so vitally on knowledge of certain of its habits.

Even the most casual comparison of notes published between 1870 and 1910, with those of the past twenty years, emphasizes the astonishing distance that has been travelled in the knowledge of this great family and, moreover, leads one to wonder, not why the lily has been so long coming into its own, but how it has ever survived the misguided attentions showered on it in the past.

Curiously enough, there have been since 1800 three sharply defined periods of lily's rise and fall in popularity, traceable in each case to the introduction of a certain variety.

Up to 1800 there had been a dozen species in common use in English gardens, all of which were mentioned by Parkinson as early as 1600. In 1804 *I. tigrinum* was brought to England from Japan. Its remarkable constitution, the rapidity of its increase, and its indifference to exacting soils and climates caused a great awakening of interest both in growing lilies more generally and in exploration for plants in foreign countries. With the finding of new species this interest increased steadily, reaching its climax when in 1862 the discovery of *I. auratum* in Japan created a furor.

The plant world literally went wild

over this lily, and for a number of years thousands of bulbs were shipped annually by the Japanese. Unlike the Tiger Lily, however, *I. auratum* soon proved itself untamable, and the inability to keep it for more than one or two years at most finally caused a sharp reaction in popular sentiment—a reaction which ended beyond the offending member and caused a wide unpopularity for the lily family in general so that only a comparatively devoted few continued to grow lilies and to study the new varieties which, by this time, were arriving in large numbers.

But in 1904 *I. regale* was discovered in a remote mountain valley in China by Ernest H. Wilson. The great beauty of this lily, its hardiness and ease of culture, its immunity to the mysterious diseases that were at that time little understood, soon placed it in a unique position among garden flowers. It became literally the queen of the garden and, most of all, it revived the almost defunct interest in scale-bulb lilies.

A fresh interest was given to scientific study of lily culture, and united investigations of plant pathologists and devoted amateurs revolutionized the knowledge of lily habits and needs, cultural methods and diseases. Early accepted theories have been reversed, and the unique make-up of the lily, which so materially influences its behavior under cultivation, is now recognized and more thoroughly understood. Why this new knowledge should materially affect the question of soils and fertilizers is a just question, but even the briefest glance at the situation will quickly answer it.

It was many years before the garden-

ing world realized the fundamental characteristics of the lily. The differences in bulb habits and root systems of various species were not understood, still less the important part played by the roots. As the new varieties appeared and showed widely differing characteristics, which apparently defied attempts at control, the greater attention of lily growers was centered on simulating the soil and home conditions of the new arrivals—a difficult and complicated undertaking as may be imagined, considering their widely differing habitats, and one which did not produce the expected results.

It was not until the new introductions were more widely grown from seeds that more intensive study could be made of their habits, and from then the discoveries made were revolutionary, so that in an incredibly short period lily growing took on a new aspect, with fewer complications and less pampering.

Take for example, the root systems of the lily. It is known, now, that with many varieties the roots are slow in developing and probably never rest; that some species have much longer roots than others; while the value is realized of the contractile roots which are part of the make-up of so many lilies, and which operate to pull the bulb to the depth needed for an adequate moisture supply: that damage to the roots threatens the life of the bulb, especially with the bulb rooting varieties: while the tangled masses of stem roots on the stem rooting varieties not only provide needed nourishment but, in case of damage to the parent bulb may be a dependance for continuing the life of the lily.

Indeed, what we have learned is a far cry from an amazing theory published in 1878 in the English "Garden" con-

cerning the stem roots of lilies, which says: "A fruitful source of injury to the successional bulbs is the stem roots, which some actually encourage by top-dressing and heaping up the soils around the lower part of the stem. These stem roots are some of them of great length, they do down, and not only impoverish the soil, but they twine themselves in and out among the scales, suck out the sap, and destroy the bulbs for next season's bloom. Rose growers wage war against suckers coming up. Lily growers should wage war against suckers going down. Every now and then remove the soil for one or two inches and carefully *clip off every vestige of a stem root*, returning the soil again." (The italics are ours.)

In like manner, we have gone far in the knowledge of handling and planting bulbs. We know that the succulent starchy bulbs must not be damaged and cannot be long exposed to air; that they will not stand stagnant water (although demanding moisture) and we are learning the different depths at which various species need to be planted. For example, it is seldom that one meets, now-a-days, the old exploded directions as to planting the madonna develop, they stifle the growth of the parent bulb, though not, curious to say, killing it, and unlike the bulblets of such lily (*L. candidum*) 4 to 6 inches deep. It is well recognized that both *L. candidum* and its hybrid, *L. testaceum*, thrive best less than two inches below the surface of the ground. If planted deeper, they show their preference for surface growth by developing bulbs at the base of the stem, practically at the top of the ground. As these grow and develop, they stifle the growth of the parent bulb, though not, curious to say, killing it, and unlike the bulblets of such lilies as *sulphureum*, *Henryi*, *tigrinum*, or *longiflorum*, they do not pull them-

selves to lower depths by any contractile roots.

Again, the new theories as to soils and fertilizers today stand in the front rank of radical changes. In the past, as above mentioned, the aim of the lily enthusiast was to reproduce as closely as possible the natural habitats of the various species. Alkalinity or acidity were of paramount importance, insistence was placed on the lean diet the lily was accustomed to, and these assumed such proportions as to bewilder and discourage amateurs.

However, in the past decade dependable knowledge has been established, and instead of cluttered-up directions for preparing different soils and food for different groups of lilies, it has been found that the majority of varieties may be successfully grown together in a neutral soil, provided they are given the one universal need of free drainage. True, there are exceptions to this rule, but they are a small minority, and for the most part confined to those lilies classed as difficult even for the experienced grower. Indeed, we are told that out of 46 species now obtainable in commerce, only about a dozen belong to this still considered "difficult group." These are:

<i>Bolanderi</i>	<i>Leucanthum</i>
<i>Catesbaei</i>	<i>Parryi</i>
<i>Duchartrei</i>	<i>Parvum</i>
<i>Grayi</i>	<i>Philadelphicum</i>
<i>Humboldti</i>	<i>Polyphyllum</i>
<i>Leichtlini</i>	<i>Washingtonianum</i>

The steps which have led to this and other discoveries have been brought to the public eye largely through the Lily Year Books of the English Royal Horticultural Society over the past eight years while recent publications such as "Lilies" by Woodcock and Coutts, and "Lilies for American Gardens," by George L. Slate, have summarized this

progress, and presented the findings to date in simple concise form. These steps cannot here be discussed at length, but only a brief summary shows the distance travelled in cultural procedures.

Take the question of drainage. Intensive study of lily roots, their functions and habits, has proved beyond question, that a deep root run, where adequate moisture is always available, is the chief demand of all lilies. There must be no stagnant water about its bulb, yet moisture must be supplied during periods of surface dryness. This means porosity of soil for heavy clay conditions and retention of moisture for light sandy soils.

This is not as contradictory as it seems, nor in any way difficult of accomplishment. In clay soils, having a sticky heavy sub-soil, digging out to a depth of three feet and incorporating a layer of broken stone or heavy cinders, together with leaf mould or other humus is the accepted practice. Above this a neutral soil, composed of a mixture of one part loam, one part sand and grit, and one part humus, will meet the needs of most lilies. Where a bulb inclines to the acid side, half humus and half peatmoss can be used.

A sandy soil should be given the opposite treatment, that is, building downward to a depth of at least three feet with a greater content of humus, to conserve the moisture which is otherwise apt to percolate too rapidly.

The presence of lime in the soil, though still a factor with some species is negligible with the following, especially if given liberal quantities of leaf mould:

Backhouse hybrids	<i>marhan</i>
<i>Brownii</i>	<i>leucanthum</i> , var.
<i>aurantiacum</i>	<i>chloreaster</i>
(or <i>croceum</i>)	<i>pardalinum</i>

<i>bulbiferum</i>	<i>Parryi</i>
<i>callosum</i>	<i>pyrenaicum</i>
<i>cernuum</i>	<i>regale</i>
<i>Davidii</i>	<i>umbellatum</i>
<i>Hansonii</i>	varieties
<i>longiflorum</i>	

Lilies that will stand more lime (though not insisting on it) are:

<i>amabile</i>	<i>Henryi</i>
<i>candidum</i>	<i>martagon</i>
<i>carniolicum</i>	<i>monadelphum</i>
<i>concolor</i>	and varieties
<i>dawmottiae</i>	<i>pomponium</i>
<i>chalcedonicum</i>	<i>testaceum</i>

Lilies that give best results in almost pure leaf mould, that is, three parts leaf mould, one part loam and one part sandy grit are:

<i>Horsfordii</i>	<i>medeoloides</i>
<i>Hansonii</i>	<i>neilgherrense</i>
<i>Bakerianum</i>	<i>nepalense</i>
<i>Wallichianum</i>	<i>japonicum</i>
<i>Leichtlinii</i> (var.)	<i>rubellum</i>
<i>Maximowiczii</i>)	<i>superbum</i>

The first steps in clearing up the acidity-alkalinity question came when it was found that seedlings of both acid and lime loving varieties flourished together in the same soil. Experiments and tests, pushed further, developed the fact that acid-loving lilies, planted in location, continued to thrive long after the acidity had leached out, and in a very few years the possibility of using a general soil mixture where extremes meet, and the majority of lilies can be grown together, became reliably established.

With fertilizers, too, there have come radical changes. In the last century, after studying the home sources of Asiatic lilies, a lean diet was considered essential to success, but modern widespread experiments have shown that lilies, with a few exceptions are great feeders, and can assimilate enormous

quantities of the proper food. This knowledge, however, has only been acquired fairly recently, so it cannot yet be definitely stated how the longevity of the plant is affected through heavy feeding.

The foods most acceptable to the lily are:

1. Phosphate, for nourishing the bulb, the most easily obtainable form being bone meal, applied to the surface and forked in.

2. Potash (for developing size and color of blooms) in the shape of wood ashes, worked in liberally when the lilies are half grown.

3. Manures, barnyard and stable, thoroughly spent and becoming what we call humus. These can be liberally dug in six inches below the bulb, and used also as a summer mulch, but must never touch the bulb.

4. Compost, as ordinarily made from vegetation and lime, used the same as spent manures.

5. Soot, mixed generously with material used as summer mulch, or with weak liquid manure, deepens and brightens the color of both leaves and blooms.

6. And probably the best for lilies, is leaf-mould, produced from decayed leaves of oaks, or from woodland growth. This should be from one to two years old, and is improved by using some grit or sand with it.

So for the amateur, possibly the most comforting of all discoveries is the fact that soil is not the controlling factor. Moreover, it takes but slight personal experience with only a few varieties to realize that the lily on the whole is not a wayward plant, and while it is subject to attack from certain diseases, as are any other garden favorites, modern science is working on the solution of these with the same skill and deter-

mined efforts as are given to the diseases of iris, delphiniums, roses, etc. Enormous strides have been made in the investigations of conditions, so long unknown, which have threatened the longevity of the lily. The causes and effects of Botrytis and Mosaic, its chief enemies, are being given a wide publicity, and scientific study of control measures is already showing astonishing results.

All of this is opening up a new avenue of approach to successful lily growing and even the least experienced amateur can look for a large percent of success if the chief demands of the lily are borne in mind, which are: 1st, that it be given good drainage. 2nd, that it have the same reasonable protection from pests and diseases that is given the rest of the garden. 3rd, that once properly planted it be left alone.

Rock Garden Notes

ROBERT C. MONCURE, *Editor*

CHOICE DROUGHT RESISTANT ROCK PLANTS

The following choice rock plants were planted in the autumn of 1939 and they have survived without much trouble the past two winters and summers and especially the drought of the last year. They were planted in a well-built rock garden amongst fairly large rocks, which are submerged for at least half in the ground. The soil is shaly clay, well drained and into which about one-half inch in thickness of leafmold has been incorporated. The whole rock garden is covered with about half an inch of limestone chips. The chips are spread evenly to the crown of the plants.

Actinea herbacea (Lakeside Daisy). This is a lovely native plant with glistening large yellow daisies in early spring on 8-10 inch stems making an attractive display for at least three to four weeks. It must be grown in full sun in well-drained and rather light soil.

Aethionema Warley Rose (New Persian Candytuft). This is a charming little plant with brilliant rose colored flowers in May and early June. It is of

compact low-growth, four inches high, and attractive blue-green foliage, which remains evergreen the year around. The blooming stems should be cut off just as soon as it has finished blooming. Plant it in well drained soil in full sun.

Arabis Ferdinandii-Coburgi. This is a most distinctive Rock Cress with dark evergreen foliage and remains attractive throughout the year. It spreads nicely but not too rapidly, forming low tidy mats that very seldom show any dead or burned spots in the center of the plant, as is so often the case with varieties of *Arabis albida* or *A. alpina*. The white flowers appear on four inch stems in early Spring and flourish well in sun and part shade.

Armeria Caespitosa Hybrids. These are very free bloomers in mostly bright pink shades and attractive during the month of May. Their wiry stems are four to six inches high with evergreen foliage.

Campanula carpatica Purple Carpet or Blue Carpet. This is a fine form having masses of lovely cup-shaped purple-blue flowers nearly all summer on low compact plants only six inches high. While it will do best in full sun,

it will also do fairly well in part shade.

Coronilla cappadocica. This is an old time favorite in England, and if you are looking for a blaze of gold in late May and June this will furnish it. It is trailing in growth and easily grown in full sun.

Dianthus Bobby. This compact growing pink blooms freely in late May and June, with a few scattered blooms off and on during the Summer and Fall. The color is a pleasing shade of rather deep pink or rose, with a crimson ring toward the center of the blooms. It is eight inches in height and thrives easily in well drained soil in full sun.

Geranium sanguineum var. *lancastriense*. This is one of the best and most beautiful hardy Geraniums. The delicate light salmon-pink blooms appear off and on all summer. It is trailing in habit and the blooming stems are seldom more than four inches high, and it grows very easily in sun and in part shade, and furthermore survives the drought.

Geranium argenteum. Although here it does not make much of a show when in bloom, its gorgeous and distinctive silvery foliage makes up for what it lacks in blooming qualities. This is indeed a choice plant and must be planted in a well prepared pocket, made well drained by working deeply in the soil a few limestone chips. It grows best in full sun.

Phlox subulata Camla alba. This is a very outstanding new Phlox, having all the good features of the already popular pink P. Camla but being easier to grow and much more compact in habit of growth. If planted in the full sun it blooms very freely in the spring and again a fair amount of bloom in the fall.

Silene alpestris fl. pl. If I had but one choice of a white rock plant, this most assuredly would be my choice.

It blooms very freely in June, with a fairly good show of scattered blossoms throughout the season. The flowers are fully double, about one-half inches in diameter, coming on branched sprays eight inches high, and it is best grown in full sun.

Tunica saxifraga fl. pl. This is an old favorite of white and pink blossoms and always dependable, the bloom persisting all summer and well into the fall. The lovely small double flowers resemble somewhat those of the double Gypsophila or Baby's Breath. Although best grown in full sun, they will get along nicely in part shade.

P. DONOFRIO

Westminster, Maryland

Dryas sundermanni

Over a period of years I have had as much pleasure from this prostrate shrub as from any plant in my collection. The stock originally came from the Pacific Coast, and about the same time I collected *Dryas octopetala* in Quebec. Since then I have had the latter and another species as well from several sources, but have not been successful in keeping them. Miss Alice Kauser assured me that I would find this to be the case but that *D. sundermanni* was of easier culture. She went on to say that she knew Sundermann personally, and talked entertainingly of him and his collection of rare mountain plants.

The original plant of *D. sundermanni* grew well enough here, and after being sure that we could cultivate it readily we set out to increase it. Cuttings in the usual manner rooted rapidly and layers also developed roots. But when these were potted and given good culture under glass they promptly died. After several tries, we solved that difficulty by planting them outside at once,

from the cutting bench, into a shaded frame—from which we developed the present technique, which is to pot when rooted, hold under glass for about a week and then plant directly into the open field bed. And at the same time we kept moving the open field beds into drier and drier locations, until now we have them in full exposure in a very light dry loam, on which water never stands. In the average winter we lose some plants, but always from snow freezing down through the straw covering and remaining as water in the spring, which rots the stems. The original plant, now some four feet one way by two the other, was badly killed out this spring in a dry and partly shaded location, but at the edges life was lusty. It is perhaps necessary to lift and divide the plants from time to time or else the soil loses its fertility and woody stems may choke each other.

When happy, this plant is a perfect mat of foliage of a rusty brown, neat and clean looking, and not more than an inch or two off the ground, except as the stems mound one over the other. Above this, in June, are the yellowish buds, which always remind me of those of the little yellow rose, George Elger, but which open to pure white flowers, single, and an inch and a half across. After the first burst of bloom there are scattered flowers all summer, and I am under the impression that the younger plants flower better, and also that if the feathery seed heads were not allowed to

form, there might be many more late summer flowers. However, I enjoy the seed heads almost as much as the blooms, so this has not been tried.

As for uses, any dry spot in a rockery would seem proper. I recall that *D. octopetala* carpeted a knoll, probably of thin soil over a small boulder beside the Laurentian trail where I took it. As we here are at about 100 feet elevation only, and our summers are hot and dry, there is no reason to think that the plant requires coddling much further south, though all *Dryas* are native to the north, or are found at considerable elevations. Certainly we have had better luck with extremely dry culture in full sun than under seemingly better conditions. Last of all, we recently made a wild garden, in which was a large ledge with the top nearly flat and containing a small hollow some five feet long, by a foot or less wide, and at the most not three inches deep. This was in an area of heavy snowfall at an elevation of some two thousand feet. Filled with soil from nearby woodland, mostly from under evergreens and quite mucky but sharp, this hollow was planted with a few *Dryas sundermanni*. They grew remarkably well, quickly covered the area and spread out onto the ledge, went through the first winter well, and have been persistent despite the very apparent dry location.

FRED M. ABBEY

Shelburne, Vermont

Rhododendron Notes

CLEMENT GRAY BOWERS, *Editor*

NOTES ON RHODODENDRON SPECIES AT
THE BOTANICAL GARDEN, UNIVERSITY
OF CALIFORNIA—PART 2

Barbatum Series: The majority of the twenty-six species contained in this group would be considered hardy in climates similar in moisture and temperature to the Pacific Coast from Monterey Bay to the southern part of British Columbia. Their nearest relatives are found in the Arboreum Series and the chief distinguishing feature is the character of the foliage, which in the Barbatums is usually covered with long glandular bristles. They require high shade and protection from prevailing winds, and, since one of their desirable characters is the attractive foliage, they should be kept in good growing condition by planting in a leafy soil where they can receive an abundance of moisture, both overhead and at the roots, during the growing period and summer months. We have not had a chance to appreciate the value of such species as *R. barbatum*, *R. crinigerum*, *R. habrotrichum*, etc., because our seedlings are as yet quite small. However, the Burmese species, *R. glischroides*, has bloomed in March for three consecutive years and, while it is not to be compared to the more popular species in size or brilliance, it has a very definite charm of its own. It should eventually become a fair sized shrub, perhaps 15 feet in height, but to date our specimen has only attained a height of 4 feet with a corresponding increase in width. It is compact in habit and branches well from the base. The medium sized lanceolate leaves are rough to the touch and have numerous

bristles particularly on the margins, midribs, and petioles. The flowers are cup shaped, borne in loose brusses of from 6 to 10 blossoms which are cream with a purplish crimson blotch at the base of each petal. The young growths appear shortly after the flowers to further enhance the plant with their bright red stems and distinctive bristles. We hesitate to admit that our only plant *R. strigillosum* has not survived, especially since it was a seedling from an excellent form at the Royal Botanic Garden, Edinburgh, where the writer was privileged to see an 8-foot specimen of this species one March, a day or so before a late spring frost marred the many loose trusses of blood red tubular flowers. Those of us fortunate enough to be on the Coast need not take such late spring frosts into consideration, so that, given a sufficiency of water on the foliage and the roots during our rainless months, *R. strigillosum* ought to be the equal of many of the existing hybrids as a garden plant.

Boothii Series: With the possible exception of *R. auritum* and some forms of *R. aureum*, species in this series are dwarf in habit and best suited for the shaded rock garden or similar location where they can be seen to best advantage. We have grown six of the sixteen species belonging in this Series and found them perfectly hardy in the San Francisco Bay Region. Judging from other growers' results, they have proven hardy as far north as Seattle, Washington. They have an affinity with the Glaucum Series which suggests to the hybridist that a combina-

tion of the hardier *Glaucums* such as *R. pemakoense* or *R. tsangpoense* with the less hardy yellow flowered *R. aureum*, *R. chrysodoron*, or *R. sulfureum*, might result in an interesting race of dwarf types. Such a race would be doubly valuable if the yellow flower character was retained.

R. deleiense (Boothii Series): A more recently introduced species collected for the first time about twelve years ago by Captain Kingdon Ward. We have yet to bloom *R. deleiense*, but specimens seen at Edinburgh were about 2 feet high and gave indications of becoming small foreground shrubs suitable for either the sheltered rock garden or semi-shady border. It is reminiscent of *R. tephropeplum* with large oblong, dark green, leaves and loose trusses of deep rose pink open campanulate flowers. It is considered hardier than its better known relative and perhaps easier of cultivation. We are indebted to Mr. David Wilkie, Assistant Curator, Royal Botanic Garden, Edinburgh, for the accompanying photograph.

R. leucaspis (Boothii Series): The foliage characters of this species induced Kingdon Ward to collect seed in spite of the fact that flowers were not in evidence. This "hunch" has subsequently proven to be a good one, since we now have an excellent dwarf Rhododendron to enrich our rock gardens. *R. leucaspis* ultimately becomes a low shrub, relatively slow growing, but flowering at an early age, thereby providing a valuable acquisition for the Alpinist who prefers to flower his plants in pans. The greyish green elliptic leaves $1\frac{1}{4}$ inches to 2 inches long, $\frac{2}{3}$ inch to 1 inch wide, are markedly pilose in the seedling stage. The flowers, which appear while the plant is still a few inches high, are salvermilky white and about 2 inches in diameter. It is seen at its best in the shel-

tered rock garden, but may require protection in colder localities since the flowers usually appear in late February and early March. This species strikes readily from half-ripe cuttings taken in June or July when inserted in equal parts peat and sand in closed frame.

R. tephropeplum (Boothii Series): An erect growing under-shrub with twiggy stems first discovered in 1920 by Reginald Farrer, but introduced to gardens at a later date by George Forrest. In many ways a counterpart of *R. deleiense*, but until we have had sufficient experience with that species, we hesitate to state which is the more desirable. *R. tephropeplum* is certainly floriferous, every growth producing terminal inflorescences of bell shaped flowers. There are several forms in cultivation varying in color from magenta to almost pure white. Our plants have flowers of a delicate rose pink, appearing in late April, and provide a delightful contrast against the dark grey green leaves when placed in groups at the front of a shady border or at the turn of a path. Easy from seed, relatively easy from cuttings, and certainly worthwhile, especially in smaller gardens.

Camelliaeflorum Series: This Series contains only two species, both of which are of no importance to the gardener. *R. lucidum* is probably not in cultivation, and *R. camelliaeflorum* has no good point to recommend its use as an ornamental. The specific name suggests that it resembles the Camellia in flower, but we can assure you that the resemblance is purely botanical.

P. H. BRYDON

(To be continued)

ON THE BEHAVIOR OF RHODODENDRON SPECIES AND HYBRIDS IN VIRGINIA

"At Washington, D. C., and southward, a region is reached where the unfavorable influence of hot, dry weath-



(Upper) *Rhododendron leucaspis*
 (Lower) *R. leucaspis*; *R. deleienseis*

er in summer makes itself felt. Here rhododendrons are none too happy, but may be grown well if a little attention is paid to their needs, especially the provisions for shade and irrigation. Since relatively little rhododendron growing is carried on in this district, it is somewhat difficult to determine which varieties are best adapted."

Since the above was published in 1935 (*Rhododendrons and Azaleas*, Bowers) some light possibly has been shed upon the matter of suitable varieties for the region south of the Potomac by the behavior of rhododendrons in my garden at Lynchburg, Va. The station of the U. S. Weather Bureau at Lynchburg has been in existence for seventy years and has complete records for that periods of time. Careful examination of them shows that the summer of 1941 was, with the possible

exception of the summer of 1933, the hottest and driest experienced in seven decades.

It would seem safe therefore to assume that any variety of rhododendron which passed through the summer of 1941 at Lynchburg with no apparent injury is a variety suitable to the region south of the Potomac, insofar as the hot, dry summers are concerned. Following is a list of the varieties, both hybrid and species, which when the 1941 summer drought had ended in October—it extended till then—were thriving:

Hybrids:

Album Elegans
 Alexander Adie
 Alice
 America
 Amphion
 B. de Bruin

Boule de Neige
 Blandyanum
 Britannia
 Caractacus
 Catawbiense album
 Catawbiense grandiflorum
 Charles Dickens
 Countess of Athlone
 Cunningham's White
 Cynthia
 Doncaster
 Dr. H. J. Lovink
 Dr. V. H. Rutgers
 Dr. H. C. Dresselhuys
 Duchess of Edinburg
 Edward S. Rand
 Everestianum
 Fastuosum flore pleno
 F. L. Ames
 Fred Waterer
 General Grant
 Gloire de Boskoop
 Goldsworth Yellow
 Gomer Waterer
 H. H. Hunnewell
 Horsham
 Hugh Koster
 Ignatius Sargent
 John Walter
 John Waterer
 Kettledrum
 Lady Armstrong
 Lady Clermont
 Lady Grey Egerton
 Lee's Dark Purple
 Loder's White
 Madam Carvalho
 Madam de Bruin
 Marchioness of Lansdowne
 Monsieur Thiers
 Mrs. Chas. S. Sargent
 Mrs. E. C. Stirling
 Mrs. J. H. Van Nes
 Mrs. P. den Ouden
 Mrs. R. S. Holford
 Nova Zambla
 Old Port
 Parson's Grandiflorum

Philippe de Vilmorin
 Pink Pearl
 President Lincoln
 Purple Splendour
 Purpureum Elegans
 Rosa Mundi
 Roseum Elegans
 Sappho
 Stanley Davies
 Smithii Aureum
 Sultana
 Van der Brocke
 Van der Hoop
 Van Weerden Poelman

Species:

R. ambiguum
barbatum
campylocarpum
carolinianum
catawbiense
Chapmanii
dauricum
decorum
Degronianum
discolor
Fortunei
maximum
minus
mucronulatum
Yunannense

A list of the varieties which failed to survive the summer of 1941 in my garden would likely be misleading because at the height of the drought the area where the plants were was infested with moles and pine mice, and in most cases it was impossible to tell whether death of the plant was due to the hot dry weather or to root disturbance caused by the moles and mice or to a combination of the two. Two or three plants that died gave no indication of having been disturbed by the rodents.

In considering the above list it should further be borne in mind that not all the varieties have proved themselves

winter-hardy in Virginia (*Smithi aureum* and Loder's white are two such), but any variety in the above list known to be winter-hardy north of Washington, D. C., might, I think, be considered year around hardy in Virginia. Indeed

those varieties which best withstand the desiccating effects of low temperature seem best to stand the drying effects of hot dry weather too.

POWELL GLASS

Lynchburg, Virginia

A Book or Two

The Tomato. Paul Work. The Orange Judd Publishing Co., Inc. New York, 1942. 135 pages, illustrated. \$1.25.

At this time when vegetable growing is of such special interest to all gardeners and the tomato plays such an essential role in world dietary, the appearance of this compact and readable volume is particularly welcome. It is a practical handbook written for the amateur from a background of expert professional knowledge and experience. While it is not addressed essentially to the amateur, it is the sort of book in which the amateur will find not only what he himself wants for his smaller activity, but the program that concerns professional production.

Asparagus Production. Homer C. Thompson. The Orange Judd Publishing Co., Inc. New York, 1942. 124 pages, illustrated. \$1.25.

Like the volume on the tomato, this has been prepared by an expert for the amateur but with full attention to the commercial grower.

Although one might recall that asparagus is not a plant for immediate return, under present conditions when many are considering a program of vegetable production for the future, this is an important contribution for all who can include this excellent vegetable in their schedule and garden activities.

Gardens for Victory. Jean-Marie Putnam and Lloyd C. Cosper. Harcourt Brace & Co., New York, 1942. 220 pages, illustrated. \$2.50.

"A little book to help your garden, however modest, produce continuous supplies of nutritious food, properly selected, on the smallest space in the shortest time, for the least cost"; so runs the opening inscription.

Another timely book. This covers the entire field for the home gardener, and with more attention to geographical and regional practices than most.

Clean, simple, well documented, it should appeal to almost every sort of gardener. The illustrations, which are diagrammatic, will also help in every phase.

Vegetables in the Garden and Their Legends. Vernon Quinn. J. B. Lippincott Co., Philadelphia, 1942. 261 pages, illustrated, \$2.50.

Any reviewer of Mrs. Quinn's is always of two minds—shall he abandon himself to the pleasure of her text or shall he force himself to verify her adventure. If he is a comfortable person he always follows the first path. This is the course the reader may well follow.

The illustrations or decorations of this book are by Miss Louise Mansfield—less medieval than those of Marie Lawson in former volumes, but no less fine and much nearer the plants.

Plant Hunters in the Andes. T. Harper Goodspeed. Farrar & Rhinehart, Inc., New York, 1941. 429 pages, illustrated. \$5.00

The Latin American countries are much in our minds and thoughts these days, and for those of us who really care about the development of a mutual knowledge, this volume is welcome. It is easy reading—full of technical names that do not overcharge the text with difficulties; full of quotations, not only from the past but from all the pictures taken by many cameras. In spite of this it remains Goodspeedian, to coin an adjective in the Spanish fashion.

Possibly the most important thing in the book is the evidence that there are untold riches in our neighboring countries for us to learn and to seek out, not merely to "exploit," and that from it all can come, an amazing unfolding of the spirit that should be our chief end in life.

Our Shade Trees. Ephraim Porter Felt. Orange Judd Publishing Co., Inc., New York, 1942. 316 pages, illustrated. \$2.00.

This is a "revised and enlarged" edition of Dr. Felt's former volume, which has been invaluable for years. One hesitates always to use such a word as complete and yet one is tempted to use that word here, knowing full well that whatever new and important matter the future will hold will be gathered into any new edition, just as very valuable chapters have been added to this, particularly those relating to a storm damage.

It may be pointed out that although many tree species are mentioned, the book is not planned about a choice of species or kinds but rather about the fundamentals of tree life and the care that they should have from man.

Propagation of Plants. M. G. Kains and L. M. McQuesten. Orange Judd Publishing Co., Inc., New York, 1942. 639 pages, illustrated. \$3.50.

This is a reference book—a revision of a book of long years' service, bringing into the original text the rich harvest of knowledge that has come during that time, particularly of late the current stream of scientific investigation has been turned on old practices, known but not understood, adding to them many very useful practices that could only have had their origin in the laboratory. There is a long and useful index, by which the reader can find his way with a minimum of difficulty.

Ornamental Shrubs and Woody Vines of the Pacific Coast. Evelyn Graham and Howard E. McMinn. Gillick Press, Berkeley, Calif., 1941. 259 pages, illustrated. \$3.00.

This is a difficult book to review in such a way that its merits will be as appealing as they deserve. It is, of course, useful only on the Pacific Coast and perhaps will be more useful in California than elsewhere. It is technical in its approach and treatment but not so technical that the good horticultural amateur should hesitate to use it. There are many illustrations, line drawings, halftones, color plates.

Lilacs for America. John C. Wister, Chairman and Editor. Published for the Association by Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pa. 64 pages.

A very useful reference work which represents the tabulation and organization of a vast amount of historical data in such form that all workers hereafter must start with this report. Not recommended for lively reading but invaluable.

A Southern Garden. Elizabeth Lawrence. The University of North Carolina Press, Chapel Hill, N. C., 1942. 241 pages. \$3.00.

There are occasions in which there is no more damning thing than to begin a review such as this by saying that the book is well written; here the reviewer will go farther and say that it is so well written that it puts many others to shame. Aside from a purely personal interest because of having seen some Raleigh gardens, the author's included, it makes no earthly difference to me what happens there in early March or mid-August, but reading this book is a pleasure that requires and sustains one's interest, piques one's curiosity, inflames one's imagination and breaks down one's resolutions. How much more could one ask? Our climates being what they are, this book may be useless as a guide of the recipe book style, but for the rest of you, read it for your own undoing!

The Picture Garden Book. Richard Pratt, with color photographs by Edward Steichen. Howell, Soskin, Publishers, New York, 1942. 143 pages. \$5.00.

If you are a reader of magazines rather than books you will have met much of this before, and if you are a clipper-scrapbook maker you will be only too pleased. It is not your reviewer's kind of book and he finds himself rather cornered in not knowing just what to say. Possibly the root of his distaste lies in the fact that the pictures seem too much like set pieces, and he suspects that if a guileless amateur were to attempt their reproduction, he would suffer all the agonies that are endured before the opening of an International Flower Show.

What anyone could find and can, if he will, is a sharpening of his eye to see color and form and texture, harmonies and contrasts—all of which are of value in garden life.

The Gardener's Pocketbook

Eriogonum sub-alpinum (Sulphur Eriogonum)

Flowers of the *Eriogonum* (woolly knees) genus do not aspire to petals but depend on calyx, or bracts, or both for their color. By this device they seem to keep their color longer than those flowers following the usual custom of having colored petals.

Eriogonum sub-alpinum retains its creamy yellow longer than its mountain neighbors of other genera, and when it does decide to rest it passes through a lovely rosy-orange-henna stage while waving farewell.

The flowers in a broadish umbrella, supported by a bare handle six to eight inches high, rise from a large flat mat

of leathery evergreen simple leaves, smooth on top, white woolly underneath.

Plants of this *erogonum* are found on sunny dry mountain slopes, at their loveliest near timberline. They settle down comfortably in the garden on deep gravel with a little peat, but do not bloom till well established. The illustration shows a plant, probably several years old, growing at an elevation of 10,000 feet on Hoosier Pass in Colorado.

Tap root habit makes this resent transplanting. Propagation is comparatively easy by means of layers, cuttings, and seed.

KATHLEEN N. MARRIAGE

Colorado Springs, Colorado

Eriogonum ovalifolium

This little dwarf *Eriogonum* (False Buckwheat) is a charming rock plant. By the way, isn't it time we found better adjectives for plants than "dwarf" which hints at deformity, and "false" which is not complimentary?

The roundish silvery grey leaves of *Eriogonum ovalifolium* form a loose rosette, attractive at all times and especially winsome in winter. In May and early June many stems carrying pink buds shoot out horizontally from the center. These open slowly into soft yellow round heads which last a long time. Then, like in sister *E. subalpinum*, they change to a warm old-rose pink before they say a final farewell.

In dry plains regions of Colorado, Wyoming and Utah we find this species growing in sand, gravel, and in stiff clay. Evidently all it asks is moisture in spring and dryness after blooming.

Mature plants have untransplantable tap roots. Even young ones are difficult. For patient gardeners seed is the surest way. Given ample drainage and kept free from crowding competitors it goes on for years, and it never has a dull moment.

KATHLEEN MARRIAGE

Colorado Springs, Colorado

FROM THE MIDWEST HORTICULTURAL SOCIETY

Akebia quinata

This charming climber is one of the comparatively unknowns in the gardens of the middle west. This was first called to my attention by its discovery on the walls of an old building in Lincoln Park where it had been growing untended and unnoticed for many years. There it had competed with Boston ivy, and poor conditions. It had been in

a measure successful enough to cover a small part of the wall. Cuttings taken and placed in good soil soon took hold and produced nice plants in a few months' time. After a winter fully exposed, these small plants have sent out runners some three feet long with the promise of getting up into the air next year.

Apparently this plant has proved its ability to survive the rigors of the Chicago climate. With good culture this should prove an excellent subject. While generally regarded as evergreen this species does not retain its foliage completely through the winter, but it is retained quite long and hence should be used where good winter effect is desired. For summer effect the five-fingered leaves are quite attractive with their smooth margins and light green color. As this is a twinner, some slim support will be needed until the plants have some height and developed wood enough to remain upright. With this listed commonly in eastern catalogues there is no reason why it should not be more generally planted in this region where it will doubtless give a good account of itself and prove one of the attractive vines.

Convallaria majalis, pink

Everyone is familiar with the common Lily-of-the-Valley. As a dependable plant for shady spots it is one of the old standbys. Once planted the lily-of-the-valley perpetuates itself by underground runners which send up new plants. It is generally only a short time until these underground runners take possession of the entire area into which they can spread. In addition to the widespread white form there is a pink variety which has been listed at fancy prices. This pink form is identical with the species in every detail



K. N. Marriage

Eriogonum subalpinum

except color which is pale flesh pink. As something different it is a desirable plant for shady places where a rampant groundcover is needed. However, the color is not the glowing pink that enthusiastic catalogues might hint, but a pale delicate shade that is pink mainly by comparison.

Azalea Vaseyi

The Middle West is not usually considered a region for Ericaceous material although many localities have numerous species represented in the local flora. The inhibiting factors are in the soil much more than in the climate. With a little care in soil preparation many of the excellent azaleas and rhododendrons can be successfully grown.

One of the finest azaleas that can be grown is *Azalea Vaseyi*. This is native to the Mountains of North Carolina and is considered to be the finest of the American azaleas. Apparently this is quite an adaptable species as it is recommended for pondside planting. However, like many other species it is quite tractable under cultivation and a moist soil suitable for other heaths will prove quite satisfactory. Because this species is limited in range it is seldom offered as a collected plant, or as a nursery acclimated plant. This is usually sold as nursery grown material and consequently commands a higher price than many of the other native species. The flowers are in clusters at the top of upright growing stems which form a

round topped bush. The flowers are about 1½ inches in diameter and a rosy pink in color. It is a May blooming species in the mid-west. It seems to be one of the hardiest and most dependable of the azaleas and it is one that should be in every collection of desirable shrubs.

Tree ferns of Hawaii

When the news reports of December 7 brought the story of Pearl Harbor my eyes strayed across the room to the small stems of tree ferns (*Cibotium chamissoi*, *C. menziesii*) which are my direct link with the islands. Small fellows with foot high trunks and eighteen inch leaves, they have graced the north window for several winters with their graceful foliage.

Practically unrepresented in large collections these species are among the most striking of the tree ferns. The leaves spread upward and outward from the stem, which is tall and robust growing. The matted hairs covering the buds are golden in *C. chamissoi*, and *C. glauca* and a mahogany brown in *C. menziesii*. The foliage is a shining dark green in the latter species and somewhat lighter in the other two. The trunk is usually a matted mass of roots, from which the plant can obtain most of its supply of moisture. In fact, when these plants are collected the soil roots are generally cut off and the stem shipped with merely the air roots. If kept moist these soon multiply and provide a new system of anchor roots while supplying all of the plants water needs at the same time.

These species of the Sandwich Islands are distinct from any growing in other parts of the world. Probably in the distant past they have descended from some of the primitive ferns that inhabit the tropics of the Polynesian re-

gion. Whatever the affinities of these ferns to the vegetation of the rest of the globe they are definitely distinct and isolated now. On the island of Oahu the ferns are dominant in many places and form veritable jungles. Under these conditions the plants develop stems up to sixty feet in height, with leaves eighteen feet long and nearly as broad.

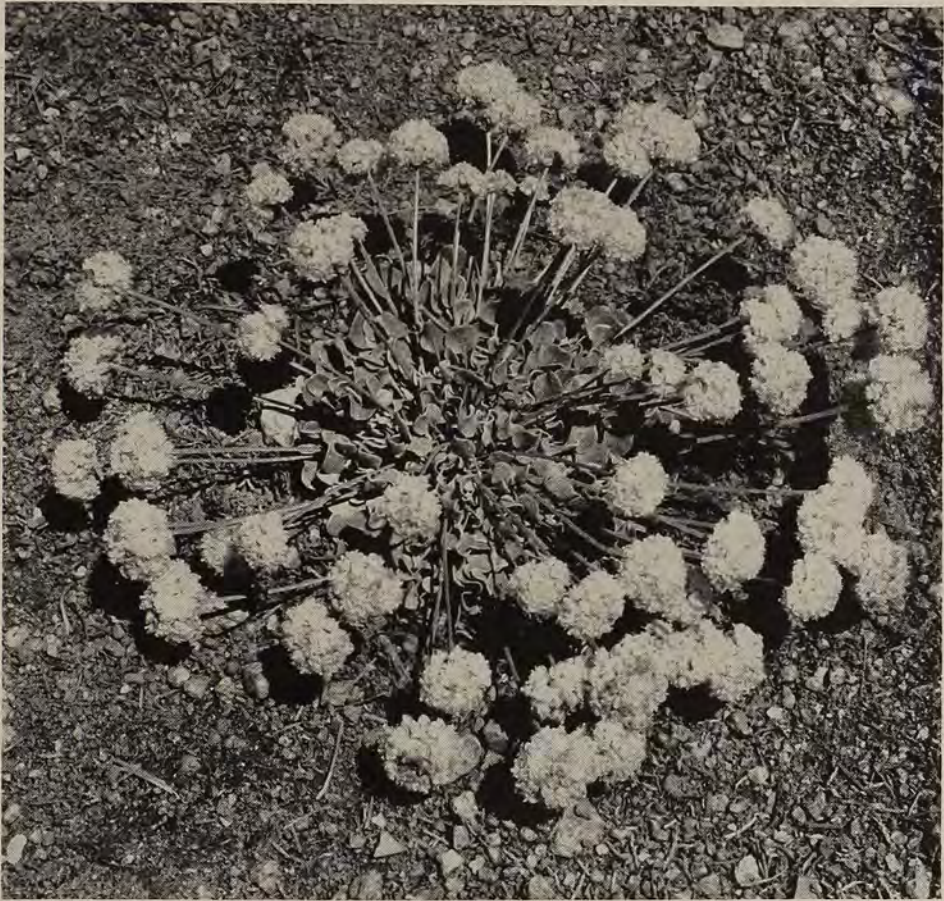
Before the advent of the white man to the islands the trees were a source of starch. The larger ferns were cut down and the small core of starch removed from the center of the stem. This was washed, pulverized and diced and then used in making the famous "poi" of the natives.

Making starch from tree ferns was a laborious and slow process. Only the larger trunks were useful as the small cores of young plants did not repay the labor involved in cutting them out. The cores had to be transported to the towns where the remainder of the manufacturing took place. With the introduction of the taro plant the importance of tree fern starch diminished until the last factory vanished about a decade ago. Now the tree fern remains as a weedy native or a beautiful ornamental depending on the proximity of the forests.

In this country the transplanted ferns are excellent subjects for conservatories, greenhouses or carefully tended window gardens.

Alliums (Onions!)

In writing of alliums in the October 1941 issue of THE NATIONAL HORTICULTURAL MAGAZINE Mrs. Fox mentions *Allium odorum*. Since the publication of Grey's *Hardy Bulbs*, Vol. 3, the confusion of alliums grown under the name *odorum* is cleared up. *Hortus Second* follows the reclassification by



K. N. Marriage

Erigonum ovalifolium, in captivity

Grey. In many gardens there have been two rather similar species of white flowered alliums known as odorum, which are now separated to *Allium ramosum* Linnaeus and *Allium tuberosum*, Röttler ex Sprengel.

The earlier flowering, July-August, *Allium ramosum*, is the one more often recommended for its delightful fragrance. Mrs. Fox mentions heliotrope; I have compared it in my notes to that of hawthorn. *Allium ramosum* easily can be separated from *Allium tuberosum* on leaf characters: *A. ramosum*

has hollow leaves, those of *A. tuberosum* are not hollow. A native of Siberia, growing up to 18 inches in neat clumps, this is a plant of value not alone to convince scoffers that an onion may smell sweetly.

Beginning in early September and spreading its blooming period more than most species, *Allium tuberosum* makes a pleasing border plant of 15 to 18 inches. Its foliage makes an effective foil for the abundant stems of white flowers; good foliage does not obtain throughout the Allium family. Grey

states that *A. tuberosum* is a native of northern India and the Far East, where it is in common use as a culinary herb. It is, however, a perfectly hardy plant. There is no noticeable fragrance to the flower but it can be used as a cut flower as *A. neapolitanus* is now used.

I do not have at hand Mr. P. J. Van Melle's discerning discussion in *The Florists Exchange* that established for a time the validity of the name, *Allium odorum*, but, as in other articles he discusses the fragrant species, I expect he may accept priority of the Linnaean, *A. ramosum*, over *A. odorum*, also Linnaean. Other authors have used the name *odorum*, however, and Grey disposes of them as follows: *A. odorum*, Karelin and Kirilow—synonym of *A. angulosum*; *A. odorum*, Lapeyrouse—synonym of *A. ochroleucum*; *A. odorum*, Tenore—synonym of *A. nigrum*.

BERNARD HARKNESS

Molucella laevis (See page 107)

The shell flower of *Molucca balm* is a curiously interesting member of the mint family which once persisted in old-fashioned gardens by self-seeding. It is now comparatively rare. Although the garden value of this plant should not be emphasized unduly because of several undesirable features, a small planting would be decidedly worth trial by any gardener with a taste for experimentation. The generic name has also been spelled *Mollucella* and *Moluccella* and a similar uncertainty apparently existed concerning its native habitat. As the name indicates, the plant was thought originally to come from the Molucca Islands, but actually is from the east Mediterranean region, in Syria.

Seeds may be sown in the open in the vicinity of Washington, D. C., but starting under glass is recommended

for places with a shorter growing season. A sandy loam is advised, but cultural requirements are simple. The flowers are slightly fragrant but inconspicuous, and the chief feature is the greatly enlarged calyx which surrounds the flower in the shape of a sea shell. The color is greenish with a faint pinkish blush, and covered with numerous reticulations. The spikes remain in an attractive conditions for a fairly long time after the flowers fade and some very distinctive decorative arrangements might be made with them. After the plants flower in July and August, they tend to dry off suddenly, leaving an unattractive mass of yellowed foliage during the fall. Planting chrysanthemums in the foreground might be a satisfactory means of dealing with this shortcoming. Another fault from a garden standpoint is a somewhat sprawling habit of growth.

V. S.

Adenium obesum DC. (See page 105)

In *Curtis Botanical Magazine* (t. 5418) there is a plate of this plant that does not resemble our photograph in the amount of foliage and the luxuriance of growth. The plate suggests, as presumably it should, a plant obviously affected by the climate, with thickened succulent stems, relatively few points producing short spurs of leafy growth and flowers.

The brief text (l.c.) is worthy of quotation in part, "Several healthy plants were kindly sent to us from Aden by J. Olding, Esq., of the Peninsular and Oriental Company's Steamers, in 1862, and from the finest of these plants, nearly three feet high, our figure has been made, in August 1863. * * * judging by a photograph sent us * * * the shrub attains a very large size, and exhibits a most curious aspect with its thick tortuous branches, and



H. F. Loomis

Adenium obesum
(natural size)

[See page 104]

very gouty base of the trunk; the flowers, however, are handsome and not much unlike those of the *Oleander*, to which family of plants this belongs. A second species (*A. Honghel* De Cand.) is found on the Senegambia. Lindley speaks of this (or probably an allied species) as found at Delagoa Bay. It evidently affects a hot dry country."

Flowers are rosy white edged pink and dotted carmine.

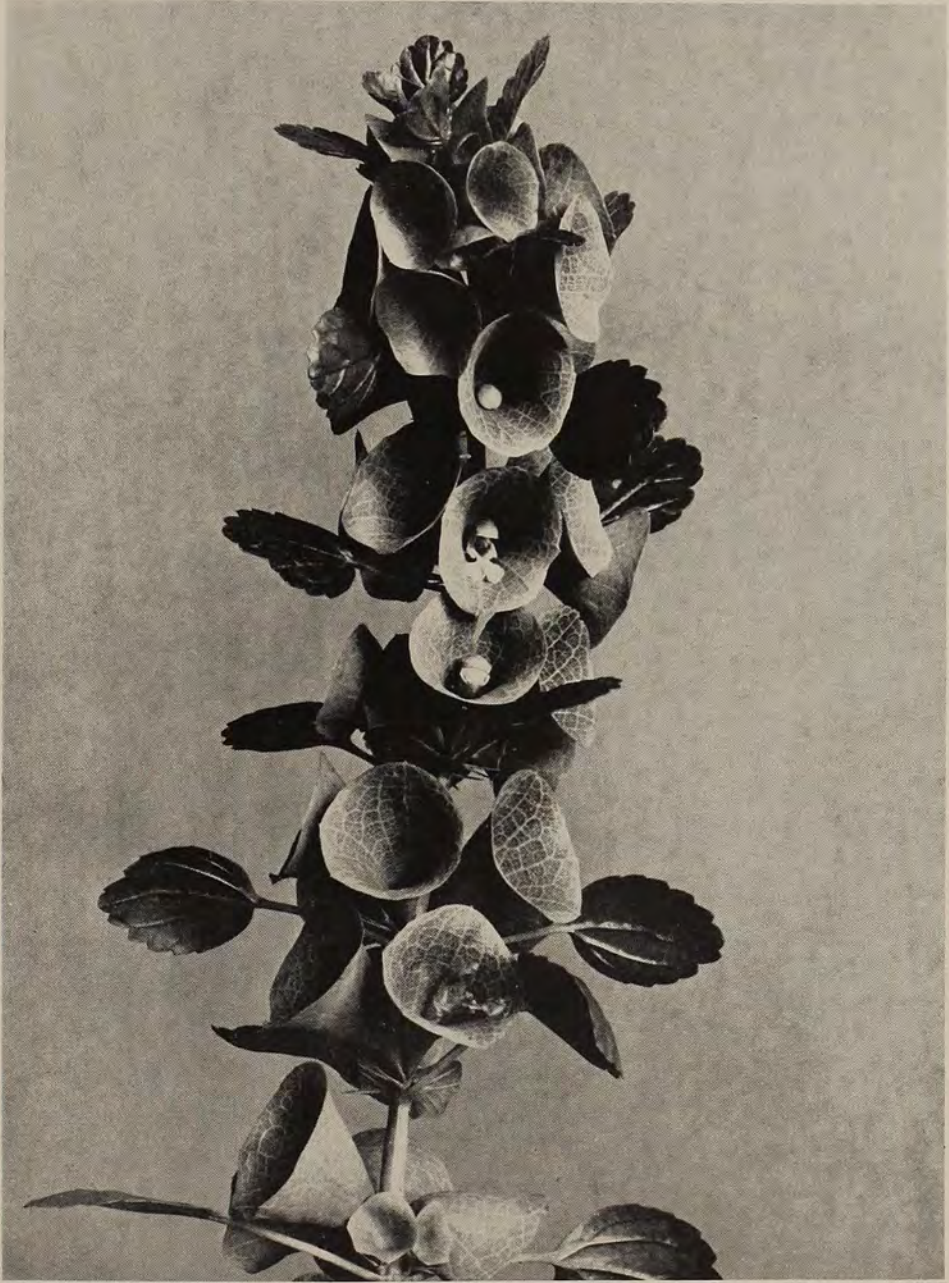
The plant that supplied the photograph was introduced to this country not from its native heath but from plants cultivated in the West Indies. Whether or not life in these more abundant climates is responsible for the great improvement in its appearance is difficult to tell. The photograph shows only flowering shoots, but they are well clothed with leaves and the flowers come not singly but in oleanderlike groups. This makes a striking contrast with the plate already cited.

Sternbergias

This is a very small genus but a most charming one, in which there has been a great revival of interest since the re-planting of *Sternbergia lutea* in the gardens at Williamsburg, Virginia, where the tradition is that they were first planted at the Governor's Palace and from there distributed to various gardens in all parts of Virginia and eastern North Carolina. From those old gardens they are being restored to the bulb trade in the United States, being falsely named "Fall Crocus" by many persons — although they do resemble in flower a giant yellow Dutch crocus. The autumn-flowering species with their clear yellow, erect blossoms are among the most delightful of all hardy bulbs. Unauthenticated legend names *Sternbergia* as the "Lily of the Field" of the Bible. Some varieties flower before the foliage, others at the

same time and one produces foliage considerably in advance (*S. macrantha*). They should be planted in full sun and well drained soil, where they can undergo a period of dry dormancy during the summer months. If rapid increase is desired the bulbs should be planted three to four inches deep in rich sandy or humus filled soil.

The late September flowering *Sternbergia lutea* is the only variety available in this country, although there may some day be unearthed in some old garden in Virginia, North Carolina or South Carolina the form known in England as *S. macrantha*, which produces its leaves well in advance of the appearance of the flowers in October and November (Grey, Hardy Bulbs, Vol. 2), and may be what was known to Clusius and Parkinson as "Persian daffodil." Both of these forms are said to be widely distributed throughout the middle and eastern Mediterranean basin as far east as Persia. *S. colchiciflora* has a rather small bulb, and the small and beautifully dainty blossoms appear in late August and early September in my garden with no accompanying foliage. The bulbs I have were collected originally, I believe, in Asia Minor. *S. graeca*, a native of the mountains of Greece, has proved fickle in my garden and sulked for two winters before showing any sign of life above ground, finally putting forth short and narrow leaves last spring, but produced no blossoms in the fall. *S. sicula*, said to be a native of Sicily, has produced regularly slightly larger but similar foliage each fall, but no blossoms have put in their appearance. The foliage of both these varieties is very short and narrow in comparison with the sturdy and tall foliage of *S. lutea*. *S. Fischeriana* is the only spring blooming variety and has withstood three winters in my garden in a southern



Molucella laevis

[See page 104]

exposure but did not bloom last spring in March because nipped by snow and sleet. According to Colonel Grey, it is a native of the Caucasus, and therefore it should be the hardiest of the group. A new species reported from the Caucasus in 1936—*S. Alexandrae* sp. n.—found, I believe, by M. F. Sakhokia in Kabistan District of Azerbaidjan, and described by D. I. Sosnovskii (Akademia nauk. Azerbaidzhenkii filia Botanicheskii Institut Trudy, Vol. 2, 1936). However, I am sceptical until I see the plant and the blossoms—it may only prove to be a local variation of *S. lutea* or *S. macrantha*. In the September, 1941, Bulletin of the Alpine Garden Society Miss Ruth McConnell mentions finding in December on the road between Jericho and Amman in Trans-Jordan a variety named *S. Clusiana*. Could this perhaps be *S. macrantha* masquerading under another name, especially in view of the late blooming period, a characteristic of *S. macrantha*?

ROBERT C. MONCURE

Primula Forrestii

This species is probably the best known of the Bullatae Section, which has provided good garden plants.

It is truly an Alpine primula which resents moisture in winter, but revels in well-drained, lightly shaded positions, and although it may be grown as a pot plant, it is better adapted to planting in high positions in the rock garden, or on a dry wall.

As to soil conditions *Primula Forrestii* is reputed to do exceedingly well where lime is present, and is moreover supposed to be a native of limestone districts.

On the other hand it is known to flourish where there is no lime, and this I can vouch for, as here it has proved to be as robust as the common

polyanthus, and appears to be one of those plants that can be happy in either calcareous or acid soil. Unfortunately it is short-lived unless precautions are taken to give protection from the winter rains which are anathema to it.

Owing to its dislike to our winter season it has been thought to be of dubious hardiness, but I am convinced that it is excessive moisture and not frost that is the greatest enemy of this primula.

It is of very distinct appearance, forming a very tough, wooden, creeping stem, from the base of which the oval and wrinkled leaves are formed into rosettes.

The flowers which are produced in drooping clusters are of a rich golden yellow, and possess a delightful fragrance; a characteristic which is also to be found in the dark green leaves.

Primula Forrestii is easily raised from seed, which it produces in ample quantities. Incidentally, this is the only means whereby propagation can be successfully carried out.

H. JEFFREY

Totnes, Devon, England

Bletilla striata

There are always plants in one's familiar catalogues that intrigue the fancy but never quite enough to precipitate one into purchase, until there comes a time when one does capitulate as if to lay a ghost. The subject of this note is or has been such with me.

In the autumn of 1940 the roots were bought and planted at the foot of a gentle slope in soil well dug with the same sort of leaf compost that delights the azaleas that line the upper slope, covering the tuberous rhizomes that looked as if they might do their own deciding about coming up, not more than five inches.

They did come up, but the season



H. L. Loomis

Bauhinia sp.

[See page 110]

of 1941, with its prolonged drought through the summer and early autumn, brought forth no greater harvest than small rather sparing tufts of finely plaited leaves that suggested those of the tigridia in a faint way, this and never a sign of flower. There was little thought, however, that the roots would have grown enough in this ill season to give any reward in 1942, but June brought a fine surprise in five flowering stems. Perhaps they touch a foot in height, rising above the leafy base, with small but beautifully fashioned flowers, more or less like a cattleya at first glance. The best stalk had five flowers, the weaker one or two. The color is hard to define, purple as in Hortus seems a little too strong although the color falls there assuredly. It is warm and pure, partaking both of deep rose and of violet, with darker markings on the lip.

Whether or not they will remain as hardy residents in this rather casual garden remains to be seen. They have passed through zero weather with their leaf mulch and one fine drought. That seems a favorable augury for permanence.

Takoma Park, Md.

Bauhinia sp. (See page 109)

Nearly every gardener from the North who goes to Florida for the winter, know the brilliant orchid-like flowers of *Bauhinia variegata*, which in good seasons cover the tree with their amazing blooms, common enough in the opinion of those who pursue only the strange and rare but still eye-filling in their own right, whether they be in the type color which is rosy purple or in the more chaste pure white form. He knows too the similarity or better the suggested similarity of the leaves to those of the Judas or red-bud tree, a suggestiveness which comes more from their carriage on the tree and their color and surface than from their shape, since these are two-lobed and not heart-shaped as in our tree.

But it sometimes happens that knowing the genus only from this one species, he does not carry over the similarities to those species that are more nearly clambering woody vines than trees or shrubs.

The subject of this note is such and more will follow at a later date to recount its particular characteristics and value.

NARCISSUS—DAFFODILS

My new 24-page catalog describes Hermitage Gardens originations, also novelties and standard varieties.

EDWIN C. POWELL

Rockville, R.F.D. 2, Maryland

WATER LILIES

Beautiful New Catalogue Now Ready

Fully illustrated instructions on building and planting pools.

Full description of our large, healthy, guaranteed plants. Surprisingly low prices. All plants shipped Postpaid. Send for your FREE copy now.

VAN NESS WATER GARDENS

SAN ANTONIO HTS. UPLAND, CALIF.



1500 VARIETIES

Peonies, Iris, Poppies and Hemerocallis

Ask for Free Catalog No. 95

C. F. WASSENBERG

VAN WERT, OHIO



WATER LILIES

All colors: hardy, day and night bloomers; aquarium plants; complete water gardens.

TROPICAL AND GOLD FISH

Rare species; collections at reasonable prices. See them in the CATALOGUE IN COLORS. 10c.

Over 100 subjects illustrated in natural colors with 200 black and white illustrations. Send for this catalogue today. Only 10c.

Beldt's Aquarium, 2233 Crescent Ave., St. Louis, Mo.

CACTUS and other SUCCULENTS

Free Illustrated Catalogue



FOR SALE—Profusely Illustrated, Super-Excellent Books

Cactus for the Amateur, \$1.00

Succulents for the Amateur, \$1.50

KNICKERBOCKER NURSERY

ROUTE No. 3

SAN DIEGO, CALIFORNIA

Wild Flower Plants and Ferns

Thirty (30) Plants, our selection or your preference as possible, \$3.00 postpaid. Good variety, for shady nook, rockery and pool. Catalogue, free on request, with description, history and culture suggestions.

WAKE ROBIN FARM

James Loder Park, Prop.

Route 2, Home, Pennsylvania

MENTION THE
NATIONAL HORTICULTURAL
MAGAZINE

WHEN DEALING WITH
OUR ADVERTISERS

A New DAFFODIL YEAR BOOK

is just out

THE FIRST IN THE A. H. S. SERIES SINCE 1938

It is a joint publication of the

ROYAL HORTICULTURAL SOCIETY

AND THE

AMERICAN HORTICULTURAL SOCIETY

Well known growers in Australia, Great Britain, New Zealand, Tasmania and the United States describe the fairest and best among daffodil aristocrats. There are 22 illustrations and 96 pages of exciting daffodil news.

Price 75c

THE AMERICAN IRIS SOCIETY

The American Iris Society, since its organization in 1920, has published 85 Bulletins which cover every phase of iris growing. These bulletins go four times each year to all members, who may also purchase any back numbers in stock for 50c a copy. Because the bulletins are not for sale except to members a

SPECIAL INTRODUCTORY OFFER of SIX for ONE DOLLAR is made to non-members. The six are our selection from surplus stock.

THE ALPHABETICAL IRIS CHECK LIST, edited by Ethel Anson S. Peckham and published in 1940, is an invaluable reference book for all who grow irises or wish to know about irises. The book lists about nineteen thousand names of irises (including synonyms and mis-spellings) and contains as nearly as is humanly possible all the old species and varieties as well as the new ones, with added information about obsolete varieties, species, section, season, color and fragrance. There is a long list of names of breeders, introducers, dealers and authors, with brief biographical details. The binding is durable, water-proof cloth, and in spite of its 582 pages the book is of a size comfortable for holding and carrying. The price to A.I.S. members is \$3.00, to non-members \$4.00.

Orders should be addressed to the office of the Secretary, 821 Washington Loan & Trust Building, Washington, D. C., and checks made payable to the American Iris Society.

A RARE BARGAIN

AT a recent meeting of the American Peony Society the Board of Directors voted to make a drastic reduction in the price of the peony manual, good until available supply is exhausted or until the first of the year. **Present price, \$2.25, postpaid.**

Every peony lover should have this manual with supplement, bound in one book, as it is an encyclopedia of peony knowledge obtainable from no other source. Manual originally sold for \$6.00. Present price far under cost of production. If you are looking for a real bargain, here's your chance. Don't hesitate, they are going fast at this price. Circular on request.

Membership in the American Peony Society, four splendid bulletins and the beautiful, helpful Manual, only \$5.00. Make remittances to the American Peony Society and mail to

W. F. CHRISTMAN, Secretary
American Peony Society
Northbrook, Ill.

YEAR BOOKS

of

THE AMERICAN HORTICULTURAL SOCIETY

THE AMERICAN DAFFODIL YEARBOOKS, 1936, 1937, 1938

THE AMERICAN LILY YEARBOOKS, 1939, 1940

THE LILY BULLETIN FOR BEGINNERS, 1941

No good gardener should be without these books. They represent milestones in the horticultural progress of our country. Each differs from the other so there is no duplication. The Daffodil Yearbooks are fifty cents postpaid; the Lily Yearbooks, one dollar; the Bulletin, twenty-five cents. Please address, The Secretary and make check to the Society.

BACK NUMBERS AND REPRINTS OF THE NATIONAL HORTICULTURAL MAGAZINE

There is a small stock on hand of most of the magazines from January, 1927, to date. Liberal discounts are made on orders of 6 or more. Reprints from some of the magazines may also be secured.

See page IV for price list.

THE AMERICAN HORTICULTURAL SOCIETY
821 Washington Loan and Trust Building
Washington, D. C.

Price List of National Horticultural Magazines

Regular Price 75c a copy, 4 for \$3.00

Vol. 6, 1927—Jan., Apr., July, Oct.	(4 numbers)	\$3.00
“ 7, 1928—Jan., Apr., Oct.	(3 “)	2.25
“ 8, 1929—Jan., July, Oct.	(3 “)	2.25
“ 9, *		
“ 10, 1931—Oct.	(1 number)	.75
“ 11, 1932—All	(4 numbers)	3.00
“ 12, 1933—Jan., Apr., Oct.	(3 “)	2.25
“ 13, 1934—Jan., Apr., July	(3 “)	2.25
“ 14, 1935—All	(4 “)	3.00
“ 15, 1936—All	(4 “)	3.00
“ 16, 1937—Apr., July, Oct.	(3 “)	2.25
“ 17, 1938—All	(4 “)	3.00
“ 18, 1939—All	(4 “)	3.00
“ 19, 1940—All	(4 “)	3.00
“ 20, 1941—July, Oct.	(2 “)	1.50
	—	
	46	\$34.50

SPECIAL PRICES—

Single copies 60c (except as noted for 1941)**.

6 or more numbers, up to 15, at a discount of 25% of regular price.

15 or more numbers at a discount of 30% of regular price.

All 46 will be sold as a set for \$20.00.

Checks should be made payable to

THE AMERICAN HORTICULTURAL SOCIETY

Room 821—Washington Loan & Trust Bldg., Washington, D. C.

*Vol. 9 (1930) is very limited and contains Mr. Morrison's translation of H. Correvon's *Les Joubarbes*. It is now very valuable but the full year (4 numbers) will be sold as long as the supply lasts for \$10.00.

**Single copies of 1941 magazines, if purchased without numbers of other years, will be sold at the regular price of 75c per copy.

The American Horticultural Society

INVITES to membership all persons who are interested in the development of a great national society that shall serve as an ever growing center for the dissemination of the common knowledge of the members. There is no requirement for membership other than this and no reward beyond a share in the development of the organization.

For its members the society publishes **THE NATIONAL HORTICULTURAL MAGAZINE**, at the present time a quarterly of increasing importance among the horticultural publications of the day and destined to fill an even larger role as the society grows. It is published during the months of January, April, July and October and is written by and for members. Under the present organization of the society with special committees appointed for the furthering of special plant projects the members will receive advance material on narcissus, tulips, lilies, rock garden plants, conifers, nuts, and rhododendrons. Membership in the society, therefore, brings one the advantages of membership in many societies. In addition to these special projects, the usual garden subjects are covered and particular attention is paid to new or little known plants that are not commonly described elsewhere.

The American Horticultural Society invites not only personal memberships but affiliations with horticultural societies and clubs. To such it offers some special inducements in memberships. Memberships are by the calendar year.

The Annual Meeting of the Society is held in Washington, D. C., and members are invited to attend the special lectures that are given at that time. These are announced to the membership at the time of balloting.

The annual dues are three dollars the year, payable in advance; life membership is one hundred dollars; inquiry as to affiliation should be addressed to the Secretary, 821 Washington Loan and Trust Building, Washington, D. C.

