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The American Horticultural Society

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Begonia Davisii

[See page 8]

Pleasures of Gardening

MRS. FRANCIS KING

SOME months ago I came across a most refreshing and delightful book, "Pleasures of Architecture," by C. and A. William-Ellis. This book gave to think in many ways but before opening it I began to consider its title with regard to this other subject so nearly related to architecture and to wonder whether I might not set down a little reflection, a bit of reminiscence on those pleasures which have come my way in a life largely spent in the garden, in rooms lined with garden books, and among people to whom gardening is the very breath of life, who believe with Candide, "*Il faut cultiver nos jardins.*" "Pleasures of Gardening," a title which opens wide doors to vistas of happy hours and days.

Asking myself then, what *are* the pleasures of gardening, there come to mind these very casual divisions of the subject: meeting other gardeners, garden correspondence, garden talk, the seeing of gardens, the reading about those far off; the pleasure of novelties in and for the garden; and above all the pleasure of work in the garden.

Let us take garden talk first. This divides itself naturally into three kinds: talk which is discussion between equally able gardeners; talk in which one gives information; but best of all to my way of thinking, talk in which one learns from his companion in the garden. (Richardson Wright lately wrote,—"*The true gardener lives and dies learning.*") The first is pure pleasure, the second is altruistic but still a pleasure, the third pleasure and profit combined. Then it is that one whips out a notebook and pencil, jots down the unfamiliar, the new, the unknown, runs to one's house, falls upon one's knees and gives thanks for the

existence of the really great in gardening such as Miss Jekyll, Dr. Bailey, Professor Sargent, Miss Willmott, Henri Correvon, and for amateurs who have made thorough studies of certain plants, shrubs and trees, and whose opinions are nuggets to so casual a gardener as myself. What of talk over tea in the garden? There is nothing to quite equal this. The warmth of the tea, its gentle stimulation bring qualities into the talk which suits the place. Tea in a garden in ten minutes makes friends out of strangers if their tastes coincide as these two things. Between sips all subjects from the newest type of columbine to the next presidential candidate may and do come up. Intimate talk develops here in scenes which impart a sense of beauty, and leaves one of those spiritual fragrances that linger and bless.

I see myself at St. Augustine sitting at dinner next a delightful man lately elected United States senator from a southern state. I had thought of course our talk would have been partly political in tone. Not at all,—gardening and principally geraniums were our topics. Again I see myself on one of the North Sea boats between the Hook of Holland and Harwich with two companions, a Dutch botanist who had studied in Austria, Germany, Japan, and a well-known Viennese nurseryman from Buenos Aires, whose horticultural knowledge and deep enthusiasm ranged over the world, whose talk transported one from the gardens of the Alcazar to the great little-known arboretum of seven million trees near Montevideo by Senor Lussich.

And next to talk come letters; there are those heart-felt letters one writes occasionally in praise of a garden, those

of which one keeps no copy. For the mere motion of reaching for the carbon paper would snap the thread of thought if that were tense. How fatally easy it is to lose this tenseness and how untimely are those things that cause its sudden fading. I remember visiting with a group, a most lovely rose-garden, a place where of all places one would have wanted to be alone. I remember a flush of rapture in a beauty so unexpected, so poetic as to lift the heart; when suddenly a bored question in a nasal voice most cruelly broke the spell and took me to all that is beyond such a garden, to dull reaches where those live who neither see nor hear when beauty speaks.

Among the debts that I owe to an institution in all these gardening years of mine is a very heavy one to the post-office of the United States. Working with a precision that many a private business might envy, it has brought me in the past, it brings me in the present, shrubs, plants, seeds, cuttings, above all letters. Letters of all types and kinds, principally, if the truth be confessed, letters asking for help, but many giving it, and occasionally letters that flash upon one the very heart of the correspondent through this medium of the love of gardening. I will read a few bits of letters taken at random from my files. From a stranger in Massachusetts: "Will you kindly suggest to me a plant or shrub to fit the corner of my house? It would not get a great deal of rain; the house faces south and west. I would like something four or five feet tall. This is the first year I have had a garden and I am so anxious to get the right thing. I think I have read every garden book that was ever printed—at least that's what they tell me at our public library." From a stranger, an Englishwoman in British Columbia: "I am starting a new gar-

den in a new world, and as it is a hill-side garden, I find it a stupendous task, so much of it has to be clothed with trees and shrubs to begin with on three sides. However, it looks out on a lake of indescribable beauty, jewelled and shimmering—and that alone gives me heart of grace." In that same letter occurs this sentence, "Gardening is the key to unlock every heart."

From a friend in Rochester, New York—"One sees such inexcusable things, like the annual mass of red and yellow tulips in our otherwise beautiful public parks."

From a friend, a woman landscape architect: "I shan't die happy till someone gives me a whole village street to redeem. Never another private garden. I can't give the time for it or any isolated piece of property even on a village street, but one section of a street, both sides, would make me pull up my sleeves and feel as if I had been drinking coffee. It makes me furious to know that this country will go to it yet and lead the world in rural town-planning, but it will come just as I am old and rheumatic, or on the very day after my funeral—too late for me to get into the fight."

A letter from a professor in an Eastern University: "To my mind no one has written so wonderfully about flowers as Reginald Farrar. His verbal pictures of flowers are as wonderful as Ruskin's of architecture, his powers of invective are as great as Whistler's. But what a country is England, where a sober member of Parliament and a writer like Farrar are willing to travel to the Tyrol to settle a dispute as to whether *Saxifraga oppositifolia* grows on the shady side of a ravine or on the sunny side."

And last, from a great Dutch nurseryman in this country: "Americans are not used to the slow processes of

horticulture. They are lazy when it comes to work. One can almost distinguish one's nationality when one knows a man in his work. The Hollander works because he knows it is necessary; the dykes taught him to work. The Frenchman works because he loves it, just to work, till the soil, water his plants, see things grow. The German works in order to get there—he wants to succeed. Later he leaves working to somebody else. But the American does not argue with himself and does not work. If America would be inhabited one year by the French, how different things would look! How front and back yards would change appearance, what a different country it would be. True, many good Americans would be shocked by seeing them work on Sunday mornings and sometimes the whole day, but—is it not religion to make this world look beautiful and can it be done without work?"

Here is a letter from David Fairchild, who wrote "Exploring for Plants," in which he describes a little Arab garden in Morocco, made and laid so beautifully as to have unique charm. Here is one from Mrs. Morris in China saying, "The house today is filled with regal lilies, gathered from the mountains," and a photograph enclosed of her lovely garden with its moon-gate. We speak of China and how sad we grow; but we think of our gardens and realize afresh that a garden is

"a smile amid dark frowns, a beloved light
A solitude, a refuge, a delight."

Next, meetings with great gardeners. My first meeting with Miss Jekyll long ago was brought about through English friends in Chicago and was at her house in Surrey. Letters had passed between us and Miss Jekyll had helped me in many ways, but I was unprepared

for the warmth of her welcome, and this made it all the pleasanter. Unfortunately for the garden part, on each of my visits to Munstead Wood, rain has fallen. In 1925 I saw it once again after several years. The same gravely-smiling, white-haired serving woman answered my pull of the wrought-iron bell at the door, ushering me into the same beautiful low-ceiled drawing-room with its fine furniture, its old stuffs and porcelains all about, its windows giving upon the wide green walk through woodland; and in a moment came swiftly toward me the dear Miss Jekyll herself, her hands outstretched in welcome. We sat in talk for a little, then a neighbor come in by appointment to go over a garden plan with her, and she sent me to the garden. There wandering in the rain, I came upon one of the compositions by this master hand which once seen could never be forgotten. It was, of course, in the spring garden; all that led up to it, a series of gardens, was wildly, richly green with spring. Here before me in long drifts (that good planting word originated for gardening by Miss Jekyll) were single white early tulips, white iberis, pale yellow hardy alysums, some of the glorious purple sage (this of the color of red cabbage, than which there is nothing more beautiful in plant color, and plant texture), tulips pale yellow and orange again, while at the further end of these waves of color rose up in full bloom that shrub which I long for and can never have, *Berberis Darwinii* with its hanging flower clusters of rich orange. The picture was a revelation of what the artist's touch can do for the garden. Back to the house then for a few words of farewell—but the soft voice, the expressive face and merry glance of my dear friend and mentor in gardening are pleasures to be carried with me always. Asking

Miss Jekyll what I might send her from America she suggested trilliums and later come this letter: "Your delightfully welcome and most generous gift of trilliums came this morning and I have just had a happy half hour seeing them planted in their prepared beds of peat and leaf mould. They are on the shady side of one of the wood walks that we call the Fern walk, where hardy ferns are a feature and where the few trilliums I have had hitherto have always given me great satisfaction and a greedy wish, now gratified, to have many more. Within a few yards is a group of the large yellow erythronium that is so good in the end of April. Except for a patch of sanguinaria, there are no other flowering plants in this region, but they are enough and completely satisfying. The woodsy background is of birch and holly with an undergrowth of whortleberry. I cannot expect the newly planted trilliums to do much next spring, but though I shall be eighty-three towards the end of the month, I still hope for a year or two of life for the enjoyment of your dear gift, and all other beautiful growing things. My love and thanks go out to you with both hands. Yours affectionately, Gertrude Jekyll."

Miss Ellen Willmott twice came to see me at the Garden Club in London. We had delightful talks and her kindness was marked. Like most great people Miss Willmott's bearing was modesty itself. A rather short, slight woman of perhaps my own age, with dark eyes and hair, and whose talk was fascinating,—alert, witty. Miss Willmott's interest in plant life was many-sided, but it is as a great botanist that she became known the world over. Her name is especially associated with the daffodil, the rose genus, and with her remarkable success at Warley Place, her house in Essex, with hardy plants and alpenes.

In Holland, too, there were people one could never forget. As the jury for the Belgian show were assembling, Mr. E. H. Krelage, the president of the great flower show in 1925, presented to me, Mr. J. S. Brunton, editor of the greatest horticultural trade journal in Britain. As I had long grown the lovely clear blue delphinium, Mrs. J. S. Brunton, I mentioned this. Turning quickly, he said, "Let me introduce the raiser of that delphinium, Mr. Ruys of Moerheim." A finer face or bearing I had never seen than that of this great hybridizer and grower. His delphiniums, *Capri*, *Moerheimii*, are famous—and now the rust red delphiniums which Jackson and Perkins of Newark, New York, are preparing to send out in America, is also from him. While engaged in the pleasant discourse with Mr. Ruys, there came the high moment, for the Reverend Joseph Jacob stood before me. Letters and plant exchanges over long years had endeared him to me, I say endeared, for one could feel his fine spirit always. Very tall, broad-shouldered, smooth-shaven and benignant looking was Mr. Jacob, with a delightful smile. We had a few words together but I saw him only once more—he died, not long after, in England. But who does not know his fine daffodil Whitewell, and who that has read that little English weekly, "The Garden," can ever forget his fervent writing therein?

Little shall be said here of garden reading, of garden books; the garden libraries of America are now many and well equipped. Not one that is worth anything but will have upon its shelves all of the books of Miss Jekyll—those books which will ever be the finest guides to garden beauty for the English-speaking peoples. A little book by Frances McIlvaine, "Spring in the Little Garden," should come in for the same sort of commendation. But no

pleasure of the garden is greater than that which arises from the sudden outcropping in prose and poetry of the garden itself. Take Houseman's touch of spring, "The pear stood high and snowed." Or H. D.'s autumn lines—

Take the red spoil
Of grape and pomegranate,
The red camellia,
The most red, red rose;
Take all the garden spoils,
Inveterate, prodigal spender
Just as summer goes.

Or, in prose, this of Anne Douglas Sedgwick, "Time, embalmed time, was with them in the gardens. A mother-of-pearl sky was above their heads and along the paths the gnarled old apple-trees were full of thick pale leaf-buds. A pear tree was almost ready to flower and in its topmost branches a thrush was singing."

But coming back to concrete things: There are the new things in the garden. When the eye lights upon such words as "Five best phloxes ever introduced, E. V. Debs, Victor Heurlin, Julius Heurlin, Sunshine and Monantiquot," then is aroused the wish to explore, to bring these things into one's own borders to see whether they really are or are not flowers for an enthusiast in phloxes. I have lately set certain phloxes new to me, among irises of that one beautiful kind, Steepway; these phloxes were Blue Hill, Border Gem—two which look well with Amaranth, B. Comte, back of them a combination of dark crimson and violet really, while others paler will stand beyond—Enchantress, Betty Lou, Caroline Vandenburg. Among the two subjects seed of a magnificent tall poppy, single, has been sown, for an earlier flowering than the phloxes' and a later than the iris'.

Such plantings keep the gardener in a high state of excitement. Try some

of Isaac House's scabiosas, which they tell me surpass anything ever seen in such flowers. If you do not know it, sow next spring, at the edge of the border, a packet of Sutton's *Convolvulus minor*, Sky Blue (NOT sky-blue, oh No! but a good clear bluish lavender) and into October your border will smile at you beyond the grassy verge. New lupine seed, said to be the first ever seen in England, is being tried out in my garden—the little plants vigorous now to withstand the hard northern winter. Who is not interested in that lovely hollyhock, Sensation, with its discs of silken pink? Not until lately did I know the anagallis with its charming tones of apricot and blue, a lowly flower, but well worth trying. And if you do not know it already, get that fine ornamental spinach of Sutton's *Atriplex hortensis rubra*, which today is one of the delights of life when cut with the coppery celosia. The imagination is always keyed up as one knows that "the best is yet to be."

Best of all, however, as we said at the beginning, is work. Work is the chief pleasure of gardening. Old gloves, old dress, comfortable shoes, and is there ever a day when, on this uniform, there is nothing to be done? It may be simply weeding (the weed we have always with us); it may be that delightful sculptural occupation of pruning—for no pruning of any kind should be done without considering the better form of tree or shrub which is to result; it may be sowing or planting—fascinating pursuits in which one's mind is completely in the future; it may be the cutting away of lilac seeds in early June—this we do with recollection of the beauty just past and with hopes for that to come; or the shaping of grape vines, to give pictorial effect, the tacking upon the wall of long branches of mock-orange to make a form of espalier of that strong and

splendid bush—a thousand occupations come to mind as one thinks of work in the garden; indeed, to me the outside of a house has always seemed of more importance than the inside, and work in the open a blessing while work indoors is not quite as blessed. In these my later years I am like Drinkwater's

Old Mrs. Willow

"Nothing in her garden is secret, I think,
That's all sunbright with foxglove and pink;
And she doesn't hover round old cupboards and shelves
As old people do who have buried themselves;
She has no late lamps and she digs all day,
And polishes and plants in a common way."

In the sweet stillness of an afternoon in late September I sit in the Chaucerian corner of the stone seat at Kings-tree, look on present beauty and think on what is past. The arching sweetbriars beyond the two curved benches at the far edge of the paved garden are hung now with bright hips; great pots of petunias fling their lavender flowers about, and other petunias self-sown in the cracks of paving rise strong and bright with violet and white flowers above many tufts of that green-white sweet alyssum of Sutton's that I like best. Two charming altheas, all that are left of eight (no subjects for this climate) are in full pink flower, palest pink with deep crimson centers, while below one of them an azaleamum (horrible name!) is also pink with bloom. The Long Walk of grass is flanked by orange and yellow annuals, cosmos Klondyke at the back, fine calendula and marigold below, while now and again rise miniature sunflowers overtopping the cosmos and at every

ten feet a young new plant of aster, King George. All this has asparagus foliage as a background, with lilac and peony as the stronger subjects between. Crickets are sounding, the sun descends and lights the mountain with gold, the sky above is azure, all below is green and quiet. The smell of corn tassels from the garden, of nictines from the paved garden, of fresh-cut hay in the meadow below, becomes pungently sweet and I look at this loveliness and breathe in the autumn fragrance and realize as a hundred times before the good fortune of one who owns land both productive and beautiful.

Grapes hang thickly within the arbor. Champagne, that luscious one, will soon be ripe, its large berries now a light wine color. Tomatoes illumine their vines with scarlet, parsley is of a magnificence. A small green worm has devoured the lettuce and even the red cabbage in the border of that name has become lace-like from slugs. Still the metallic beauty of the cabbage leaf remains, those blues are enhanced by the upstanding spikes of lavender larkspur back of them and the buff annual phlox, Isabellina, in front, though dying now, gives contrast in color.

I have dark moments about the garden. I may need flowers for the house. No rain has fallen for a long time and I say, "There *are* no flowers," but on searching the borders I find there is one fine stalk of yucca in perfect condition, and in a place where it is *out* of place. Cutting this quickly I wander to the green walk below the grape arbor and there, throwing its light branches of small dark green leaves from the bank where it grows, is the perfect concomitant for my yucca flower. This is one of a fine collection of cotoneasters given me when I took the farm by Mr. Anton Hodenpyl of

Long Island, whose enthusiasm for the cotoneaster was known everywhere. To place the tall yucca with its spraying branches of dark green leaves in a dull green jar of good proportion was the work of a moment, and strong and satisfying was the effect in the room.

I have come to look forward to the flowering of tritomas, the red-hot poker (but not Pfizeri, the red and yellow one), for these set upright in a rather boat-shaped Chinese bowl, with bronze green leaves of just-turning sumac spreading apart like wings below the scarlet pokers, make a sumptuous picture. In the right sort of garden there is always something to be found for decorative use. It is the eye to find, to choose, which one must have for selection, for rejection,—and all gardeners know this experience of finding treasures for the house just before snow falls, of finding lovely things where it would seem none are to be found.

Gardening is unique in that it is not a means to an end. It is an end in itself abundantly repeated and made up of high satisfaction, pure delights. Its kaleidoscopic character, its absolute uncertainties, dependent upon such vast

and intangible matters as soils, seasons and climates, make it a thing of mystery. Is it not mystery, sensation, that the world craves today. A heralded play, a new detective story? But these things pass; they leave no trace. Whereas the garden goes from one stage of beauty to another of surprising beauty, a daily or weekly change, effect succeeding effect, while sometimes—and this alone would set the garden apart from other types of creative subjects—the less that is done to it, the more picturesque it becomes.

Not all the pleasures of gardening have been touched upon here. For this, as Maurice Hewlett says somewhere, with the possible exception of music, is the divinest of the arts. "After all, what is a garden for?" writes Miss Jekyll in "A Gardener's Testament." "After all, what is a garden for? It is for 'delight,' for 'sweet solace,' for 'the purest of human pleasure,' 'the greatest refinement of the spirits of men,' it is to promote 'jacundite of minde'; it is to 'call home over-wearied spirits.' So say the old writers and we cannot amend their words, which will stand as long as there are gardens on earth and people on earth to love them."

Begonias

LAMBERT DAY

The American Begonia Society

How long begonias have been attracting the attention of men we do not know. Old Chinese artists made use of them as models in painting and designing many years before Charles Plumier, a Franciscan monk, while on a plant hunting expedition in 1690 collected the first species of which we have a record. He gave the name of *Begonia* to this new genus in honor of Michael Begon, the governor of St. Domingo, who accompanied him on this expedition. This first specimen introduced by Fr. Plumier is probably the fibrous begonia we still have, known as *B. acuminata*.

The begonia was first introduced in England in 1777. This particular one seems to have been *B. nitida*, a fibrous species that is still a favorite of many. Since that time collectors have been scouring the globe in quest of new plant material, and have added numerous begonias to our collections. Statements in literature vary greatly regarding the number of species found, ranging from three hundred to over a thousand. Of this number it is doubtful if more than two hundred are in cultivation at the present time. Many hybrids of the now missing species are to be seen in the gardens of plant lovers all over the world.

The majority of species that we have come from Mexico, Central and South America, a few from Asia and Africa. India should perhaps have more species than has thus far been credited to her—possibly because collecting has not been carried on there as extensively as in some other countries.

Begonias may be classified, for the amateur, according to their growth habit, which naturally divides them into

three general sections. Each of the sections may be subdivided into groups to fit the requirements of individual species.

Into one section falls the begonias that have a principal root stock. This rootstock generally grows prostrate on or near the surface of the ground and in some instances is slightly elevated. Tiny rootlets are sent out from this main stock for the plant to feed upon. This rootstock is called a rhizome and plants with this characteristic are generally termed rhizomatous. Under this heading are the Rex varieties, whose chief claim to popularity are their beautifully colored leaves. They originated for the most part from Southern Asia. In this section, but in other groups originating principally from South and Central America and Mexico, are the plain leaved rhizomatous types such as *B. Feastii*, *heracleifolia*, *hydrocotifolia*, *nelumbifolia*, etc.

In another section are the begonias with the tuberous roots. This grouping contains most of the begonias with the large showy flowers. Hybridists have done almost unbelievable things with this group. As one views the original species with their small single flowers it almost tries the imagination to see growing beside them begonias with flowers four to six inches across and entirely double. The blooms simulating forms of camellia, carnation, narcissus, peony, and others.

So far there is but one species that can boast of being the only begonia that closely resembles a bulb. It is a native of the Isle of Socotra and called *socotrana*.

There are several begonias that are of a semi-tuberous nature, such as



*An unidentified Bhotan species
Tuberous rooted; specimen in 6-inch pot; flowers scented.*

Dregei, *McBethii*, *natalensis*, etc., natives of Africa.

A cross between *socotrana* and *Dregei* many years ago produced a hybrid that was given the name of Gloire de Lorraine, which was one of the first of our so-called Christmas begonias. Today tens of thousands of this, and improved varieties, are given the place of honor around Christmas time all over the world.

In the last section are grouped the begonias with the fibrous roots. This contains the majority of our begonias and could be divided into several groups. Amongst these are many that make fine potted specimens for the house, while others do best when planted out in the ground under the shade of trees and tall shrubs.

Generally speaking most of our begonias come from a tropical country. This does not mean that they are subject to a great deal of tropical heat, for they are found in most cases at altitudes well above sea level, 5,000 to 10,000 feet. The mean temperatures will range between approximately 40 degrees and 80 degrees Fahrenheit. We should remember this in the care of our begonias.

The soil in which the begonia grows in its native haunts is made up largely of humus, which is partially decayed vegetable matter. It is high in nitrogen content and slightly acid. As the rain fall is generally 200 inches per year and up, the soil must be extremely porous or the plants could not live. The soil can usually be cultivated following a rain.

While in some climates begonias may be planted in the ground, the vast majority of us must be content with pot culture. Begonias are surprisingly easy to grow if but a few simple rules are adhered to.

I believe that the single most important factor and the one that is the least

understood by the amateur is that of proper watering. It is difficult to explain exactly when a plant needs water, so some experience must be obtained by trial and error methods. Never water until the soil is dry, though not bone dry. Then soak thoroughly. While begonias like an abundance of water they will not tolerate for long a dank, soggy soil. Very little water is required when the plants are not in active growth. A plant of woody structure requires less water than one of succulent growth. Large leaved plants need more water than small leaved ones. The humidity of the surrounding air determines to a large extent the frequency with which water must be applied. It is best not to water at night during cold weather or when the air is heavily laden with moisture.

The temperature of the water should be close to that of the surrounding air. Colder water retards plant growth. The water should be clean, fresh and as soft as possible. Rain water is ideal. As begonias require a slightly acid soil it is advisable to make sure that the water used is not alkaline. This difficulty may be corrected by using about one-half ounce of a supersaturated solution of aluminum sulphate (common alum per gallon of water. Mix thoroughly and allow to settle, using only that portion which is clear.

When preparing the soil for your plants it is well to think of the pot as a pantry would be to the kitchen. Your plants will be a direct reflection of this larder, so let us fill our pots accordingly. The soil should be porous so that water and air may pass freely through it. A fertilizer should be used that becomes available slowly and over a period of several months, avoiding as much as possible fertilizers that are quick acting and serve only as a tonic with no lasting benefits. Fish meal, bone meal, sludge, compost, and animal



Begonia riciniifolia
Specimen in a 10-inch pot.



Begonia Roxburghii
Specimen in a 6-inch pot.

manures are all beneficial in this respect.

A potting soil that we like is made up as follows, using a two gallon measure. Four parts of fairly well rotted

leaf mold (oak is good), one part sharp sand that is free from alkali, two parts of compost or well rotted manure, one-half part hardwood charcoal bits, one, four inch pot level full of Nitroganic

(sludge), and a three inch pot of fish meal or steamed bone meal.

If this soil mixture seems too heavy due to the fineness of the materials used, it should be lightened by adding some coarser leaf mold, peat or sand.

When potting, fill the first inch or two of the pot with sphagnum or green moss for use as drainage. Sprinkle on top of this a few crystals of crude naphthaline or Vaporite. This procedure will help to keep earth worms out of the pots. Earth worms soon destroy the leaf mold and before long have reduced the soil to a soggy useless mass, that drains poorly if at all. Remember, a good begonia soil is one that is friable.

With this soil mixture you will find that your begonias will need little if any additional fertilization between pottings. If you wish to develop a specimen for show and exhibition purposes however, the plant should be fed each week or ten days with a weak solution of urea (1 level teaspoon per gallon of water). Do not start feeding a plant until it has had a chance to develop its root system. If food is too handy and the plant doesn't have to reach for it, the root system will not develop as it should. The first feeding should be light and then increased to a quart divided between five plants in six inch pots. It is best to feed only on bright days. Never feed a plant that is dry or one that is not in good growing condition.

Rex begonias should be kept fairly pot bound but fibrous and tuberous ones should not be allowed to become pot bound until the greater part of their growing period is completed and they are ready to bloom.

Few begonias if any will survive full sun except along the sea coast or where humidity is high, so it is necessary to protect them from the direct rays of the sun by a lath house or other means during the summer months. They may be watered freely overhead during this period, once or twice daily. This procedure helps to reduce high temperatures and increase the humidity.

During the winter if the temperature drop exceeds 40 degrees Fahrenheit the begonias should be removed to a green house. For those who grow them in the house much success has been attained by keeping the plants in a room with southern exposure where they will receive filtered sun light. If they are set into a tray that has about two inches of pea gravel in the bottom of it, they will do well. On bright days the leaves may be syringed. By keeping the gravel moist the begonias will receive about the right amount of humidity. The temperature of the room should not be allowed to fall much below 50 degrees Fahrenheit at night. Cold drafts should be avoided. If the plants are rotated occasionally so that all parts receive some sun they will grow more uniformly. If this is not done they tend to grow in one direction only, toward the light, making a lop-sided plant.

A few begonias that make good house plants are listed below, *Coralline de Lucerna*, *ricinifolia*, *Medora*, *argentea-guttata*, *Bunchi*, *conchaefolia*, *Dregei*, *Davisi*, *Haageana*, *heracleifolia*, *incarnata*, variety *Sandersi*, *manicata-aurea*, Mme. Fannie Giron, *nelumbia-folia*, *Scharffiana*, *Sutherlandi*, *Templini* and *Roxburghi*.

The Illusive Ivy—V.

ALFRED BATES

THROUGH an unaccountable oversight three illustrations were omitted from the last issue; these are now included with some additional notes which are the results of observations made during the period between the writing of the article (June, 1940) and the present (November, 1940). During this interval two more named forms have been introduced and brief descriptions, made from small plants, will also be given.

The writer wishes to emphasize the fact that all descriptions and observations were based upon house grown plants with the one exception of Hahn's Selfbranching. How the different forms of this complex will behave out doors remains to be seen. At present they are being tried out in gardens in three parts of the country and the reports on them will be included at the end of this series when the *Ramosa* Complex will again be dealt with in its natural sequence.

PITTSBURGH IVY, the form upon which the *Ramosa* Complex is based, is here shown as a year old cutting; during the five month interval it has developed several more branches than shown in the illustration and has grown some eighteen inches taller. It has every evidence of being a most desirable house plant. The plant shown in the October issue under the caption "Ivy, Pittsburgh—Cutting beginning to sport" has discontinued its sporting proclivities and has returned to normal leaf shape. I understand that attempts have been made to root cuttings having this wholly unlobed leaf-shape but so far have been unsuccessful. And the cuttings which did root have immediately returned to a

normal leaf. It is hoped that some day this unlobed form will become fixed for it would be quite an interesting and attractive plant.

MERION BEAUTY and HAHN'S MINIATURE continue to cause trouble for they seem to change into each other upon the slightest provocation. If we are to make size of leaf the distinguishing factor then I would say that the later name is merely a synonym for in several cases under my observation plants which were quite distinct as to leaf size have increased or decreased as the case might be until now they are exactly alike; such cases have occurred both under glass and outside in the open. On the other hand several have retained their difference in leaf size. But there is another factor which was not mentioned in the October issue, and which, as far as I have observed, occurs only in Merion Beauty. It is the tendency to send out long stems which immediately branch from every node and thus form long ropes of foliage. When Merion Beauty makes this type of growth it does not seem to develop a dense and compact branching at the base of the plant and is also a sturdier plant, probably because of the freer air circulation through its foliage. I have never seen any plants of Hahn's Miniature that have shown this trait; if my observation proves to be correct then this feature will be the factor which will distinguish the two. I might also add that when Merion Beauty decides to develop such strands of foliage it makes no attempt to send forth any unlobed leaves. I say all this guardedly; only God can tell what these ivies are going to do or how long they will continue to do it. I know of no other



Claude Hope

The Pittsburgh Ivy
One-sixth natural size.



Claude Hope

Variegated Pittsburgh Ivy
Provisional name. Natural size.

plants that are so independently individualistic.

(PITTSBURGH VARIEGATED) Since the earlier writing I have found the Brooklyn Botanic Garden has the same or a similar sport and we are waiting for the name which Mr. Hagenburger intends to give it. It is one of the most beautiful variegated ivies I have seen; the white in the leaf is quite pure and the gray softens the transition to green without killing the contrast. Its growth is more robust than would be expected in a variegated form. Of course there is a chance that it is not exactly the same as the Hagen-

burger form but the difference is probably so small that a new name should not be coined for it.

LONG POINT grows much more slowly than its parent and I fear that it will never be more than, to use a term from the art dealers, a collector's item. There is a refinement in its long and narrow central lobe which may foreshadow a new leaf pattern when this form begins to sport. It may even be the form which will produce a long unlobed sport for in the growth of the past five months such leaves occur. So far it has shown no tendency to branch.

GREEN QUARTZ deserves more praise



Claude Hope

Long Point Ivy
About two-thirds natural size.

than was given it in the earlier notes. As a house plant it is one of the best not only because of its growth and color but also because it may be used either as an upright attached to a support or as a cascade with its stems hanging over the edge of the pot. The unusual variegation, both in the placing of it and the color, make this form outstanding. The same variegation, two and three tones of green, has occurred on another cutting taken from Pittsburgh Ivy. In this case the variegation is in its usual place along the edges of the leaves; it is not outstanding enough to be named but is still a small plant and may develop into something of greater interest.

This autumn (1940) two more forms which belong in this complex have been introduced to the public. Their advent had been much heralded by their originator, Mr. Sylvan Hahn; but attempts, made by both the Brooklyn Botanic Garden and myself, to obtain information as to origin or the plants themselves were met with evasive replies. They were, therefore, not included in the earlier writing as I, not having seen the plants, could not give any first hand descriptions or include photographs. Through the kindness of a friend who bought several plants of each and immediately forwarded one of each to me I can now give a notice on each. As they have been under my observation for only ten days and the plants are quite small it would be unfair to judge them at the present time. Reports from some who have seen large plants of both indicate that they are much better than the plants I have would indicate.

This is also borne out by the pictures which I have seen. But there was no way of telling how many plants composed the photograph or how much dressing up the plants received before the photograph was taken. Then too the fact that they were field grown and

not pot plants would make a difference. The heavy clay soil of the Pittsburgh district especially when enriched for nursery cultivation would produce a much more luxuriant growth than the lighter potting mixture which I use for all ivies because I want a standard soil for comparison. Therefore the following notes should not be taken as final and no pictures of the plants will be given.

SYLVAN BEAUTY. These notes are taken from a sturdy plant six inches tall. The leaves are close set on the stem, internodes being from a quarter to a half inch. The leaf shape varies from an unlobed elongated heart shape with a slight indentation at base through a spoon shape with no indentation at base to a form with one or two small side lobes with or without indentations at base. The length of leaves vary from one inch to two and a half inches from base to apex and the width varies from three quarters of an inch to two inches. The color is a rich shade of clear deep green without any suggestion of gray. The plant is sending out several branches at different places along the stem the one nearest to the tip being at the fifth leaf back. As neither the leaf pattern nor the venation is interesting its only asset, at present, is its cheerful green.

MAPLE QUEEN. Notes taken from a slender five and a half inch tall plant. In the picture which I saw this form was by far the more attractive plant but the specimen before me does not bear this out. The leaves are spaced almost uniformly half an inch apart. The leaf shape is uniformly three lobed, as I recall the photograph they were five lobed and very maple-leaf shaped—they may develop so as the plant grows. The venation is fairly pronounced. The size seems to be uniformly an inch by an inch. The bases are truncated or nearly so. The color is an even tone

of medium dark green. There is no evidence of branching. The plant makes a delicate appeal to me because of leaf shape and venation and I consider it a more desirable plant than the other; however time may change my valuation.

Both plants have been patented! Now the idea of patenting a plant was one of the worst brain-storms this commercial age ever had; and when it is applied to ivies it becomes extremely silly. Any one who has worked with this genus knows how very unstable its varieties and forms are. They just won't stay put. As a case in point, some months ago Mr. Montague Free of the Brooklyn Botanic Garden showed me three groups of plants from cuttings I had given him at three different times under the same name and number and yet each group differed from the other groups but each plant of each group was similar. Of course the difference was not great enough to warrant calling them separate forms but they were by no means alike. That they all came from the same plants I can verify by my records. Take another case, this time the other way round; several years ago I received four different plants from various sources which in no great way resembled each other yet now the four are so similar that they cannot be told apart. Soil and atmosphere have a very great effect upon ivies; but how and why remains a question to be solved.

Now just what does the patent cover? Suppose the form patented reverts and is sold under the patented name; suppose that reversion sports and the unobserving florist sells that form under the patented name; suppose a reversion is discarded by a dealer who sells the batch unnamed to a florist under whose care it comes back to true form and he sells it as "just a ivy"; what happens? From another angle:—

suppose a similar sport happens in another grower's stock, not quite the same but very like it; what happens in this case? And who is to be the judge to make the decision as to what is what? None of the people who have worked with ivies who I know would care to assume that responsibility.

If sporting was a humanly controlled mechanism and not a natural one there might be some justification for patenting. But sporting is just a whim of nature which some plants possess to a greater extent than others. All the grower has to do is to keep a careful watch over his plants and make cuttings of the sports which may or may not root and also may or may not remain constant. The main trouble is going to be that an inferior form may be patented by the commercial grower and when a superior but closely resembling form is produced by another person it will be ruled out of court, in more than a figurative sense. Let us hope there will be no more patented ivies.

The receipt of these plants growing in a rich heavy clay soil brings up this question again. For purposes of comparison and observation I have been using the same soil mixture for all ivies; this mixture is composed of five parts of ordinary garden loam and one part of commercial humus. By ordinary garden loam I mean a rather light soil which drains easily and to which no fertilizer has been added. If this type of soil cannot be had and a heavier earth must be used enough sand is added to lighten it to the right consistency. No fertilizer is added save the humus. Ivies are woodland plants and therefore their main food supply is humus from the decaying leaves. Years ago experiments were made and this mixture produced the most normal results. Rich heavy mixtures produced a lush growth with extra large leaves

in most of the green leaved forms but seemed to harm the variegated forms. Rich light loam made for rapid growth with larger leaves but also seemed to weaken the plants. Poor soil made healthy slow growing plants with a decrease in leaf size. Plants grown in acid and in calcareous soils showed no preference which was rather surprising as claims are often made for one or the other. As a further test when several plants of several types of growth were transplanted into larger containers a generous addition of crushed rubble, agricultural lime and finely crushed

oyster shell was added to the potting medium and much of the old soil around the plants' roots removed. There was still no noticeable response to the lime. What chemicals the water used supplied I can not say; but I do know this that for a period the water was "hard" so hard that ordinary soap made no lather; then I moved to where the water was "soft" but there was still no difference in the growth. At no time was it possible to experiment with rain water. I can only conclude that the ivy has no preference for either a lime or an acid soil.

Neillia sinensis

Some shrubs are given a place in the garden for their ten days of brilliantly colored blossoms, others are planted for their fruit and a few for line and texture. *Neillia sinensis* from central China is a graceful shrub not only when it flowers but all summer. It must be so placed that it can be seen on at least three sides to be appreciated for its grace of line, for when crowded in a border its charm is lost.

The branches are twiggy, spread out and arch way over as if weighted down by the slender drooping racemes of flesh pink flowers. The old branches are grey, striated and ridged, while the young branches, also ridged, are tinted with rose-red.

The leaves are a deep green and almost prettier than the flowers. They are wider below the center, come to an elongated point at the apex and are rounded at the base. Their beauty is due partly to their form but more to the pattern formed by the compound incisions of the margins. They feel crisp, in fact, there is a crisp daintiness about the whole shrub.

The full height of the plant is six feet, which is attained in four or five years' growth. Thus *Neillia sinensis*

belongs to the group of medium high shrubs of which there are not too many. It will stand a slight shade. The flowers bloom here with iris, aquilegias, bleeding-hearts and dwarf deutzias.

The nodding racemes are $2\frac{1}{4}$ inches long and there are from 13-20 flowers to a raceme. They are white shaded with salmon pink with buds a deeper flesh color so that from a distance the whole raceme looks pale flesh-pink. The calyx is tubular $\frac{3}{8}$ inch long and white tinted with pale salmon pink at the base. There are little papillae-like growths on the flower stalk and the base of the calyx. The sepals turn back at the tips in five points, tipped pale green and are between each of the five petals. The petals are fastened to the calyx tube at its summit. They are rounded at the top and narrow to a short claw. The top of the flower measures $\frac{1}{4}$ inch across.

The ten stamens on short filaments extend into the opening of the calyx and their yellow anthers are lifted above it. The pistil, fastened to the base of the tube, rises slightly higher than the stamens.

The flowers are scentless.

HELEN M. FOX

Peekskill, N. Y.

A Haitian Cactus Palm Adapted to Florida

O. F. COOK

THE RICH endemic flora of Haiti contributes another notable palm, *Oothisrinax anomala* (Beccari), to the cultivated series, a distinctive type suitable for garden planting in southern Florida, and also for conservatories. The generic name *Oothisrinax*, pronounced in four syllables, refers to the oval form of the fruits, in a group where only round or flattened fruits have been known. Several other unique features warrant the specific name *anomala*, although the specimens studied by Beccari did not include the remarkably specialized leaf-sheaths armed with rigid needle-like spines that give the trunk of this palm its remarkable resemblance to a cactus, shown in figures 1, 2, and 3.

In the sense of being only recently named and described, *Oothisrinax* is a new genus, but its history traces back to the great pioneer botanist of the seventeenth century, Charles Plumier, who also discovered the *Bornoa* palm, as related in *The NATIONAL HORTICULTURAL MAGAZINE*, November, 1939. With a new genus becoming known, new comparisons are made of the related groups and wider perspectives gained, for tracing the development of the specialized characters. Each species represents a separate solution of the problem of life, each genus a solution of long standing.

The wealth of palms in the West Indian flora has not been appreciated. With the palms of Haiti alone, an impressive exhibit might be formed. Such a collection would be of scientific value and of much educational interest, most of the species being strictly endemic, not found in the other islands. Four

of the Haitian palms, *Bornoa*, *Pseudo-phoenix*, *Roystonea*, and *Inodes* are of massive proportions; *Acrocomia*, *Calyptronoma*, and *Copernicia* are of medium size; while *Bactris*, *Thrinax*, *Coccothrinax*, *Oothisrinax*, and *Geonoma* are relatively small and slender, though not diminutive. At Petionville or in other valleys above Port-au-Prince locations probably could be found where all of the Haitian palms would show their normal characters and habits of growth, and also provide supplies of seed for general planting instead of *Livistona* or other imported palms. The district of Port-au-Prince is accessible and most attractive, with great natural beauty and a delightful climate, protected from hurricanes by the southern wall of high mountains.

Most of the Haitian palms may be expected to thrive in Florida, but to place them under suitable conditions their habits in nature should be known. The smaller kinds have advantages from the standpoint of propagation, in requiring only a few years to reach the stage of seeding. The first planting of *Oothisrinax* in Florida is producing good crops of seeds, and off-shoots as well, so that commercial propagation may be feasible. It may be necessary to raise the seedlings in pots, since other members of the *Thrinax* group are difficult to transplant, possibly because the roots have brittle shells, hard to handle without damage.

The characters of the flowers and fruits show a definite relationship of *Oothisrinax* with the native silver palm of southern Florida, *Coccothrinax argentata*, but the habit of growing in clusters gives *Oothisrinax* a greater re-

semblance to another native palm, *Paurotis wrightii*. The leaves of *Oothis* and *Paurotis* appear much alike in being regularly fan-shaped, but the two palms are not closely related, and their habits in the wild state are very different. *Paurotis* grows in tropical savannahs, and in the Everglades of Florida, subject to flooding in the rainy season and to burning in the dry season, while *Oothis* grows in broken country on exposed slopes or in rather open forest.

Paurotis is larger than *Oothis*, with long erect inflorescences, the flowers with functional perianths, the pistils with three carpels, and the petioles distinctly toothed, while *Oothis* has small slender inflorescences, naked flowers, single pistils, and smooth petioles. *Paurotis* is related to the saw palmetto of Florida, *Serenoa repens*, and to the Mexican genus *Brahea*.

SPECIALIZED HABITS OF PALMS

Many of the palms are definitely adapted to particular conditions, as of soil, moisture and access of sunlight. Nobody appreciates as yet the extent of such specialization. In introducing a new palm, the habits and cultural requirements must be known, as well as the size the palm may reach, and its distinctive features or special uses. Thousands of residents of Florida wish to raise more kinds of palms, and are anxious to know what precautions are necessary, but there is no alternative to learning the habits of the different kinds.

The notion of all palms requiring more or less the same conditions and care is quite erroneous and misleading. Gardeners with great experience in the handling of other plants often are entirely mistaken in their treatment of palms, and even in large collections of palms, cared for at great expense, many

kinds fail to grow. The palms that thrive and behave normally in greenhouses and conservatories have similar habits in nature, in being specialized to live in the undergrowth of tropical forests, with continuous shade and moisture. Many palms are thus specialized and must be kept in sheltered places in order to grow well and reach normal maturity.

In striking contrast with all of the forest palms are the many others that never grow in forests, or even in shady places, but thrive only in the open, with full exposure to the sun. Such kinds are never seen in greenhouses or conservatories, except as juvenile plants. Some of the sun palms have a partial tolerance of shade in the early stages, but reach limits where they cease to grow. Some kinds do not live beyond the seedling stage, while others may languish for several years.

Hundreds of kinds of palms undoubtedly could be brought to maturity in southern Florida, with sufficient skill and care, but relatively few kinds have been found to grow readily under the usual conditions of yards or gardens around Miami and Coconut Grove, on the limestone rock formations with little surface soil. Some of the palms that grow in conservatories also thrive in Florida, even in open plantings, but others need more shelter, deeper soil, or more regular supplies of moisture than usually are provided. The kinds that grow readily in Florida are not the forest palms requiring shade conditions, but those that thrive in locations reached by direct sunlight, at least for a part of the day.

Oothis shares a habit of many palms that grow in exposed places, of producing around the base of the trunk large cushions of superficial roots that absorb surface moisture, serve as a mulch, and resist fire. Three of the native genera of southern Florida, *Thri-*



H. F. Loomis

Fig. 1. *Oothisrinax* in dry forest



H. F. Loomis

Fig. 2. Fructing Oothinax palm with offshoots



H. F. Loomis

Fig. 3. Armed leaf-sheaths covering the trunk

nax, *Coccothrinax*, and *Simpsonia*, frequently show this habit, and since these root-cushions undoubtedly represent a specialized character of the palms, a technical name *rhizotyle* may be needed.

Not only the palms, but most of the native flora of the Keys and the lower part of Florida is definitely tropical, closely related to the forest flora of the West Indies and the Bahama archipelago. The West Indian forests are not so deep and dense as those of the continental regions of Central and South America, but rather sparse and open, like most of the woodlands in Florida. This explains why the West Indian palms are not so highly specialized for forest conditions as those of the continent, and why palms from the West Indies are more likely to thrive in Florida than palms from Central and South America.

TOLERANCE OF SHADE

A partial tolerance of shade is indicated by *Oothisrinax*, to an extent that may be appreciated by comparing figures 1 and 2, showing mature palms growing in rather open second-growth forest in the district of Gros Morne in northern Haiti, on the southern slope of the mountains between Gonaives and Port-de-Paix. This district was visited with Mr. Harold F. Loomis August 26, 1927, when the photographs were obtained. These low dry forests have a scorching heat, and the palms are guarded by "Spanish wasps," with a paralyzing sting, greatly feared by the natives.

From the smaller leaf-crown in figure 1, the absence of fruit, and sparse development of off-shoots, this group appears less normal than that shown in figure 2, where the forest canopy admitted more sunlight. Such palms eventually would be smothered if the forest growth continued, but some of the trees defoliate in the dry season, or

fires may sweep through and leave the forest more open. The palms may have passed their juvenile stages before the forest closed in.

An ability to live in partial shade is one of the essentials of a conservatory plant, and in this respect *Oothisrinax* may be superior to other members of the *Thrinax* series. The potted plant specimens of *Oothisrinax* shown in figures 9 and 10 were brought to Washington in 1927, and stood for several years in a dark corner of the greenhouse, but later were moved to better quarters and began to grow. Palms of the same age have flowered and fruited in Florida. As with other clump-forming palms, more off-shoots are developed in open locations than in the forest, and grow more rapidly, so that a dense mass of foliage is formed before the trunks are developed. Propagation from off-shoots may prove practicable, and transplanting may be facilitated by the habit of forming superficial roots.

SPINES LIKE CACTI

It may assist to more general understanding of diversities of habits to recognize that some members of the palm order are adapted for exposure to sun and drought, like other dry-country plants and some even compete with the cacti as specialized desert types. The massive *Washingtonia filifera*, a native of southern California, is an outstanding desert palm, also *Chamaerops* in North Africa and *Nannorrhops* in Beluchistan. The doum palms of Africa, species of *Hyphaene*, are among the most resistant types, extending beyond the range of other vegetation in the hottest African deserts, between the Nile Valley and the Red Sea.

Many tropical countries have small desert areas of barren sand or exposed rock formations, and many kinds of palms are confined to such places,

growing with cacti and other resistant types. Some of the palms have spiny roots, and some of the cactus spines have sheaths that suggest root-caps. The *Oothis* palm is doubly specialized, with spiny roots on the lower part of the trunk and spiny leaf-sheaths on the upper part. The extent of specialization may be appreciated by comparing the natural-size figures of the indurated leaf-sheaths of *Oothis* in figure 5 with the open network of slender fibers of the small native *Coccothis* of southern Florida, usually known as *C. garberi*, shown at the left of figure 4. An even coarser network, but with only short teeth, occurs in a Cuban palm referred to as *Coccothis*.

The spines of cacti and of many other plants usually are interpreted as of selective value for purposes of protection against animals or birds, though the development of the spiny armature often seems to be carried far beyond any possible need of mechanical protection, but other uses may be discovered, as shading the surface of the plant, or holding more moisture from rain or dew. The formation of spines may even be viewed as a physiological function and of possible assistance to the plant in disposing of waste products of growth or reproduction.

A protective function would be suggested for the spiny covering, but the actual use would remain doubtful, since Haiti has no grazing animals. Like most other palms, *Oothis* doubtless would be exterminated if regularly exposed to grazing by cattle, which soon get the habit of pulling out the young leaves while still tender, and thus destroying the terminal bud. Even the saw palmetto of Florida may be completely killed in a fenced pasture. Cattle doubtless would avoid mature trunks of *Oothis*, although the old spines may break off, as appears from

the rather dilapidated group photographed by Professor Bailey, "Gentes Herbarum" 4:241. The survival of more kinds of palms in Haiti than in Santo Domingo may be due to Haiti not being a cattle country, which Santo Domingo has been from the Spanish period. This also may explain why Haiti is much more populous, the tendency of a grazing industry being to restrict the human population.

A SPECIALIZED LIGULE

With the palms, as with grasses, two primary elements of leaf-structure may be recognized, the sheath and the blade. Grasses have open sheaths with overlapping margins, while palms have cylindrical sheaths enclosing the terminal bud. The leaf-scars of palms form complete circles around the trunk, though usually broader on the side that supports the blade of the leaf. Leaves of grasses have no petioles, while among the palms two kinds of petioles have developed. In the fan-palms the upper part of the leaf-sheath serves as a petiole, but in the pinnate palms the petiole represents a basal section of the midrib or rachis, which is a part of the blade element of the leaf, instead of the sheath element.

With the leaf morphology thus interpreted, the ligules of the fan-palms appear to be entirely homologous with the ligules of grasses, as specialized rims of the leaf-sheaths, at the junction with the blade. The ligule in this view is a primitive structure, and doubtless has little function except to strengthen and support the base of the leaf-blade by the tissues of the ligule becoming indurated. A new term, *hastula*, has been substituted by Professor Bailey, but seems unnecessary and likely to cause confusion, since ligule has been in general use. The special form of ligule in *Oothis*, with broad lateral lobes or

auricles, as shown in figure 4, has not been recognized in other palms.

SUBLIGULE AND ANTLIGULE

Two attendant leaf-structures, the subligule and the antiligule, may be reckoned as analogous to the ligule. They are found in only a few palms, but both occur in *Oothis*. The subligule has the position directly corresponding to that of the ligule, at the end of the petiole, where the leaf-segments are inserted, but on the lower side of the leaf. The subligule of *Oothis* has the form of a low transverse rim or flange, rather abruptly broadened and decurved in the middle, as shown in figures 4 and 6. The greatest development of the subligule noticed thus far is in the saw palmetto of southern Florida, *Serenoa repens*. A drawing of a leaf-base of *Serenoa* has been published by Professor Bailey, "Gentes Herbarum" 3:296, stated in the legend to represent *Sabal minor*, but that palm has no subligule and the leaf is split nearly to the base.

The name *antiligule* has been given to an upward extension of the rim of the leaf-sheath cylinder on the side opposite the petiole. In the genus *Desmoncus* the sheath cylinder as a whole is prolonged above the attachment of the petiole, forming an ocrea as in *Polygonum*. An antiligule might be viewed as a partial ocrea, although there is nothing to indicate that the two organs are related in development.

The first example of an antiligule to be recognized and illustrated was that of the Rooseveltia palm from Cocos Island near Panama, in the "Smithsonian Miscellaneous Collections," Vol. 98, No. 7, Pl. 6, 1939. The antiligule of *Oothis* is represented by the row of spines projecting from the leaf-sheath, in figures 5 and 7. The spines are not formed by merely coarsening the leaf-sheath fibers, or by a division

of the margin of the sheath into teeth, but by a large oblong tongue-like extension of the sheath, with thin, loose-textured evanescent margins and surface tissues, eventually exposing the rim of indurated spiniform fibers. That the spines of *Oothis* are not marginal structures, but formed inside the leaf-sheaths renders them analogous with the needles of *Rhapidophyllum*, the needle palm of our southern States.

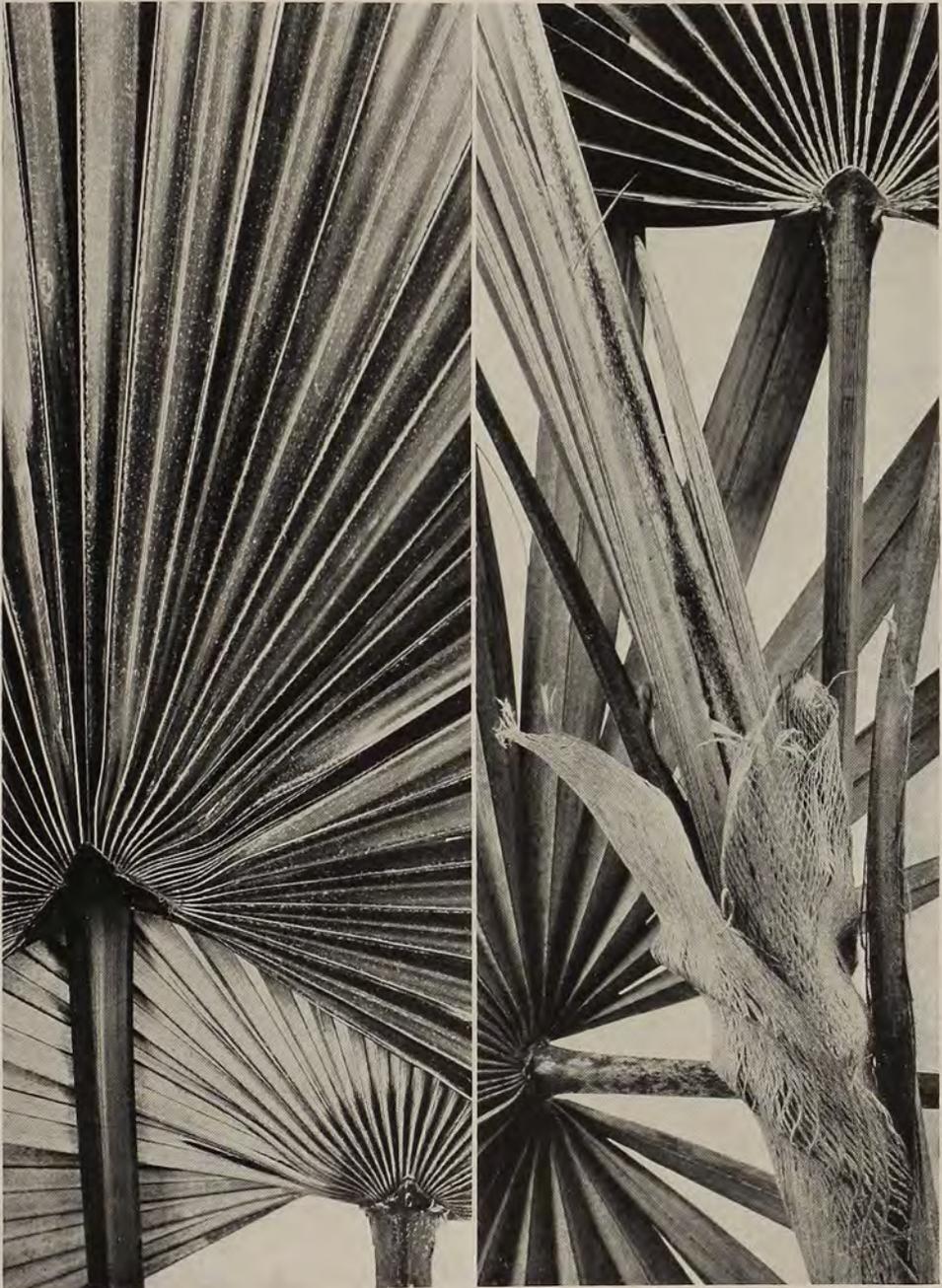
ELASTIC INFLORESCENCES

An underlying character of the *Thrinax* group has been overlooked, a feature that affords a better understanding of the suppressed perianth and the simple pistil. The axis and branches of the young inflorescences have an elastic texture and elongate rapidly when the stage of flowering is reached, after the stamens and pistils have completed their development. Since the buds are not exposed, a functional perianth is not needed and has been eliminated. Selective advantages may be seen in reducing the floral envelopes and suppressing the abortive pistils. Also the pedicels of the flowers are reduced in some members of the group but retained in others.

The elastic inflorescences are of relatively soft texture, though not brittle, and when first exposed are pure white in color, becoming pale green after the fruits are set. The young fruits turn green in advance of the branches. The texture appears similar to that of filaments, which in many plants are capable of rapid elongation. Derivation of one tissue from another is conceivable, by way of metaphasic variation.

SUPPRESSION OF THE PERIANTH

The reduction of the floral structures and the specialization of the elastic tissue are the morphological and evolutionary alternatives of enlarging the spathes to cover the flowers for a



H. F. Loomis

Fig. 4. Ligules and subligules of *Oothisrinax* and *Coccothrinax*
(Natural Size)

longer period of development, as in several groups of palms, notably in the coconut and the royal palm families.

Many palms have valvate spathes, opening at the side, but the spathes of the *Thrinax* group are tubular, opening at the end like those of palmettos and most of the other fan palms. Most of the tubular spathes are described as "incomplete" because the inflorescence grows out of the spathes at an early stage and the buds are exposed during long periods of development. The elastic inflorescences are an adaptive expedient for making the spathes functionally "complete," to the flowering stage. A general tendency may be recognized among the palms to transfer the accessory floral functions to the prefloral parts.

RELATED PALMS IN FLORIDA

Three of the native palms of southern Florida belong to genera that are related to *Oothis*, and also are distributed through the West Indies. They are small sturdy fan-palms, and may be described in general as a maritime group, growing chiefly on small islands like the Florida Keys and the Bahama Islands, or in coast districts of the larger islands, and apparently preferring the less favorable conditions, the barren wind-swept places, rocky or sandy, with little soil, exposed to long periods of drought, and occasionally burned over. Many of the hardwood trees that form rather low forests of the coast districts lose their leaves in the dry season, thus permitting more sun to reach the palms.

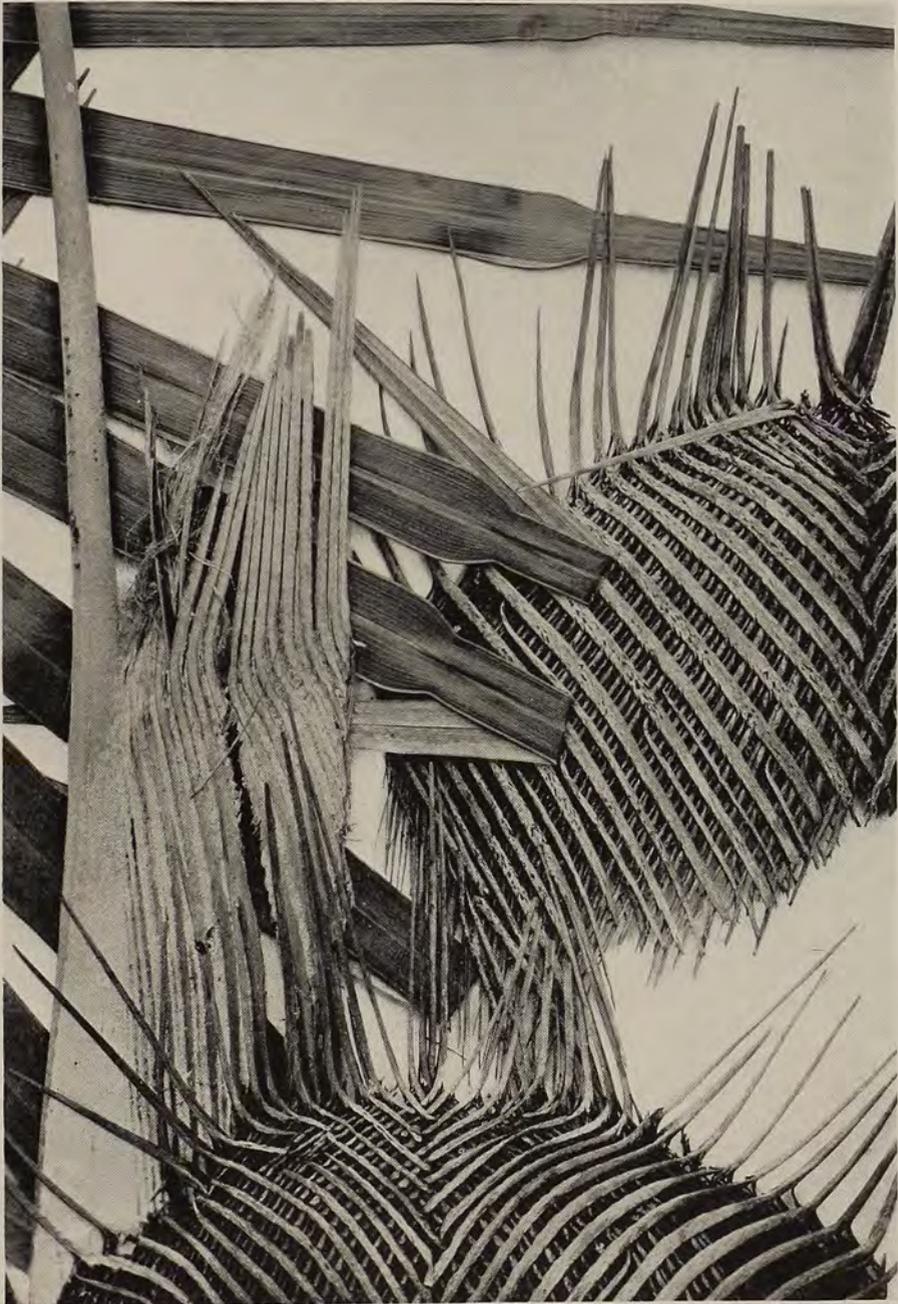
One of the Key palms extends to the mainland and is very abundant in the open pine forests around Miami and Coconut Grove. It usually is known as the silver palm, from the leaves being silvery white on the lower side, but deep green above. The Florida palms were referred at first to species that

grow in Cuba, Jamaica or other West Indian islands, resulting in much confusion regarding the names. The name *argentea*, alluding to the silvery leaves, was used with several species in the West Indies and with the Florida species. Professor Bailey recently has discovered that the original application of the name, in the form *argentata*, goes back to Jacquin, 1803, to a palm from the Bahamas, probably identical with the species later described by Sargent from the Florida Keys as *Coccothrinax jucunda*.*

The genus *Thrinax* is represented in Florida by a rather slender palm growing abundantly among bushes and trees on some of the upper Keys, with bifacial leaves borne on strong petioles and held erect in two series, facing each other. The related genus *Simpsonia*, with spreading cretaceous leaves, grows fully exposed on open rock formations of the lower Keys, and has a stout columnar trunk, giving a marked resemblance to the cabbage palmettos that also grow in a few locations on the Lower Keys. Large cushions of superficial roots are another adaptive feature of *Simpsonia*, anchoring the palms to the rocks, absorbing moisture, and resisting fire. The inflorescences probably are the largest in the *Thrinax* group, the seeds the smallest and most abundant.

The production of offshoots sets

*The name *argentea* is considered by Professor Bailey as sufficiently distinct from *argentata* to be continued in use, and is applied to a palm from the Dominican Republic, described and illustrated as *Coccothrinax argentea*, "Gentes Herbarum" 4: 248, 1939, but a different name seems necessary and *Coccothrinax baileyana* is suggested. The palm for which the name *Thrinax argentea* was first used by Loddiges appears from the "Index Kewensis" to have come from Panama, and the name *Thrinax argentea* was used many times, as by Seeman in "Popular History of Palms," for a palm that is very common on the Isthmus of Panama, and later was named by Wendland *Acanthorhiza warszewiczii*. This indication is confirmed by the description of the Loddiges specimen in the Schultes edition of the *Systema Vegetabilium*, 1830, from the leaf segments being deeply separated, to 1½ or 2 inches above the base, and with few veins. In the *Coccothrinax* group the deeply cut leaves are closely and evenly veined.



H. F. Loomis

*Fig. 5. Attachment and texture of leaf-sheath
(Natural Size)*

Oothis apart from the other members of the *Thrinax* group, all of them growing as solitary palms. Offshoots of *Coccothrinax* in southern Florida have been reported by Presley in the "Journal of Heredity" for December, 1934 (25:485), but may be similar to the sterile inflorescences that sometimes occur in date palms. Roots are formed on some of these offshoots, but it is not certain that they serve for propagation. Groups of trunks like those of *Oothis* were not found among the *Coccothrinax* palms in southern Florida, nor is the cespitose habit known to occur in the West Indian species.

THE THRINAX FAMILY

Several families of American palms were defined in 1913, in the "Contributions from the U. S. National Herbarium" 16:251, but the *Thrinax* family was not distinguished from the palmetto family. The leaves are fan-shaped in both groups, but the floral structures and adaptations are very different, those of the *Sabalaceae* primitive and unspecialized, with the flowering branches emerging from the spathes at early stages of development, the perianth functional, and the pistils always three, while the *Thrinacaceae* have simple pistils and only rudimentary perianths, the flowers borne on specialized elastic inflorescences not emerging from the spathes until the stamens are mature.

The *Thrinacaceae* form a compact group with the leaves, inflorescences, flowers, and fruits showing unique features. No other palms have simple pistils, nor the styles gradually broadened into hollow funnel-form stigmas. In most of the palms only one carpel develops, but two abortive carpels are present with remarkable regularity. The ivory palms are the only family with more than three carpels as a

group character. A few of the cocoid palms have four to seven carpels, but the reduction to a single pistil in the *Thrinax* family has no parallel.

The regular reduction of the perianth to a functionless rudiment shows that this is an ancient, long-standing specialization, which finds a complete parallel only in the male flowers of the ivory-palm family, *Phytelephantaceae*, although the two families are widely divergent in structural features, as well as in habits and distribution. The ivory palms, which are highly specialized to live as undergrowth in the deepest tropical forests, have very large fruits, each containing several of the large "vegetable ivory" nuts, while the fruits of the *Thrinacaceae* are small berries eaten by the birds, and the seeds thus scattered. Ivory palms are dioecious, with the flowers of the two sexes separate and extremely different in texture and size as well as in form, the female flowers with a very large perianth assimilated to the bracts in form and texture.

The delicate minute perianth of the *Thrinax* group apparently is assimilated to the staminal cup, and this interpretation may apply as well to the male flowers of *Phytelephas*. The number of stamens in *Phytelephas* is very large and the perianth is a fringe or ruffle with minute teeth. The ivory palms are highly specialized to live as undergrowth in deep wet forests, and are confined to the northwestern part of South America, not extending beyond the Isthmus of Panama.

The limitation of the *Thrinax* family to the West Indian flora, including the Bahama archipelago and southern Florida, has a close parallel in the *Pseudophoenix* family, another primitive group with bisexual pedicellate flowers, little related to any of the continental palms, unless it be to the *Ceroxylaceae*, the wax palms of the



J. W. Hubbard

*Fig. 6. Inflorescence and lower surface of leaf
(Natural Size)*

Andes. Most of the other palms of the West Indies belong to families that are widely distributed on the American Continent, from Mexico to Peru, although most of the species and many of the genera are extremely local. The original centers of most of the American palm groups appear to lie in South America, although a different palm flora existed in western North America in geologic times, with several surviving genera in Mexico and in our Gulf States, as *Washingtonia*, *Erythea*, *Glaucosphaera*, *Brahea*, *Serenoa*, and *Rhapidophyllum*, none of these extending to the West Indies. The genus *Schippia*, described from British Honduras by Burret in 1933, may be allied with *Thrinax*.

GENERIC GROUPS INDICATED

In numbers of species and genera, the *Thrinax* family is the principal group of palms in the West Indian region. Eleven generic or subgeneric names have been used, *Coccothrinax*, *Euthrinax*, *Hemithrinax*, *Oothrinax*, *Porothrinax*, *Schizothrinax*, *Simpsonia*, *Thrinax*, *Thrincoma*, *Thringis*, and *Typhlothrinax*. Several of these are abortive names, but other genera remain to be recognized. Professor Bailey has listed 40 names of species published under *Thrinax*, and Herr Burret has published eight new species of *Thrinax*, *Coccothrinax*, and *Hemithrinax* in a single paper. The group is considered difficult to classify, presumably because the critical diagnostic features have not been recognized.

Each of the family groups requires separate study in order to discover and formulate the specialized characters that mark the divergence of the species and genera. The range of specialized characters among the members of the group is notably widened by new features recognized in the study of *Oothrinax*, which doubtless will assist

the classification of the group. Detailed study of the palms under natural conditions is greatly needed, and characters for field recognition should be pointed out. At least three other genera are plainly indicated, of which good illustrations have been published, of species that may be regarded as generic types.*

A Cuban palm with a strangely developed antiligule may bear the name *Antia*, suggested by the Latin word *antiae*, meaning a forelock, the antiligule of this palm not forming a comb of stiff spines as in *Oothrinax* but a pendent fringe of hair-like fibers, from which the type species received the name *Thrinax crinita* by Charles Wright in 1859. One of the original specimens, No. 3967, collected in Eastern Cuba, is in the United States National Herbarium, a leaf and a leaf-sheath. The antiligule fibers are about 50 cm. long, the leaf-segments 95 cm. long, nearly 5 cm. wide at 48 cm. from the base, gradually narrowed, split at the tip for 4.5 cm., these 8 mm. wide, joined to the next segment for 35 cm., the lower segments united for about 15 cm. Ligule with lateral lobes such as in *Oothrinax*; subligule prominent only in the middle, apiculate, densely fringed in the young state; midribs of segments tuberculate below, also all the venlets minutely tuberculate, and covered with sordid appressed tomentum. Primary branches of the inflorescence have many stout secondaries and short, thick pedicels, indicating a rather large palm, probably of striking appearance.

Fairchild published in the "National Geographic Magazine" for December, 1934, a striking photograph of a fan-palm, extremely slender like a bamboo fish-pole, growing on an uninhabited forest-covered island called Beata, in the Caribbean Sea, off the south coast of Haiti, visited by the Allison Armour Expedition. The name *Beata* may be shared with the palm, which has been described by Herr Burret as *Coccothrinax Ekmanii*. The outstanding characters are the extremely attenuate trunk, often arcuate or flexuous, triangular-attenuate ligule, exerted and deeply bifid secondary spathes, deeply lobed perianth, six stamens on long filaments, papillose exocarp, filiform persistent styles, sulcate endosperm, and apical embryo. *Thrincoma* is a tall attenuate palm in Puerto Rico, much more robust than *Beata* and much closer to the original type of *Coccothrinax*.

Burret named in the same paper *Coccothrinax Ekmanii*, *Hemithrinax Ekmaniana*, and *Thrinax Ekmanii*, also *Copernicia Ekmanii* and *Pseudophoenix Ekmanii*, the name thus losing any distinctive value and becoming a nuisance rather than a respectful tribute. Using a personal name once in a family of plants would be a decent restraint. Dozens of plants are named *Ekmanii*, as from a mere inertia that Ekman himself would have despised. He would have taken the trouble to find good names for his plants. He was a marvelous plant collector, working with the tireless zeal of a missionary martyr, sparing no effort or hardship.

Complete contrasts with *Beata* in habit and habitat are presented by the third genus, *Pithodes*, from Azua Province, Dominican Republic, a palm with a short, corpulent trunk, suggesting the name. The palms grow entirely in the open, like *Simpsonia* on the Florida Keys. An excellent photograph and a detailed description have been published by Professor Bailey, "Gentes Herbarum" 4:253, under the name *Coccothrinax spissa*, referring to the short, densely branched inflorescences, with two or three primary branches nearly as large as the terminal cluster. The leaf-segments are deeply cleft into narrow slender lobes. The flowers have short pedicels, a large sharp-pointed

CLASSIFICATION OF OOTHRINAX

Before *Oothisrinax* became known, the genera appeared to divide into two natural series represented by *Thrinax* and *Coccothisrinax*. These groups may merit recognition as tribes or subfamilies, with *Oothisrinax* standing apart as a third group, or *Oothisrinax* may seem to connect the two groups, some of its characters being intermediate.

Distinctive characters of the *Thrinax* group are the long, densely tomentose leaf-sheaths, split below the petiole, long interfoliar inflorescences, large numbers of primary branches, small hard-shelled fruits, very small seeds and uniform endosperm.

The *Coccothisrinax* group has shorter leaf-sheaths, not split below the petiole, but with a fibrous expanding network on the other side, rather short infrafoliar inflorescences, with a few strongly developed primary branches, larger fruits with fleshy pericarp and deeply grooved endosperm.

The features of *Oothisrinax* that set it apart from the other series are the cespitose habit of producing offshoots and growing in clumps, the coarse, persistent, spiny leaf-sheaths, the small, slender inflorescences, the primary branches few and small, the flowers and fruits distichous on the branches, the ovary strongly cristate, the exocarp deciduous at maturity, and the staminal ring connate with the pericarp. As in *Coccothisrinax*, the leaf-sheath does not split below the petiole, and the endosperm is dissected, but the structure and texture of the fruit is very different, the pericarp not ripening to a purple or black berry as *Coccothisrinax*, but to a white berry that dries to an empty white shell, as in *Thrinax*.

perianth, six stamens, and large oblate fruits, more than a centimeter in diameter. Such palms occur in several localities in the central plateau of Haiti, and have notably short, broad spathes opening on one side, the two basal spathes deeply bifid in the middle.

HISTORY OF OOTHRINAX

The discovery of the palm by Plumier in the seventeenth century was recorded in a Latin diagnosis published in 1703, "*Palma dactylifera radiata minor aculeata*," and a detailed drawing was made showing the habit of growth and the remarkable spiny leaf-sheaths. The drawing remained with Plumier's collections at Paris, but apparently was overlooked or disregarded by Martius and other botanists who assigned names to most of the other palms obtained by Plumier. None of the botanical explorers of the West Indies in the eighteenth century appear to have found *Oothisrinax*. Eventually, after more than two centuries, Plumier's drawing was reproduced by Burret in 1929, in the "Proceedings of the Swedish Academy of Sciences."

The first detailed description of the palm was published by Beccari in 1908, under the name *Coccothisrinax anomala*, with *Oothisrinax* as a new sub-genus. Additional data are furnished recently by Professor Bailey, "*Gentes Herbarum*" 4:239, but only poor examples of the palm are figured, affording no promise of value as an ornamental. A new name, *Zombia antillarum*, is proposed by Professor Bailey, but seems unnecessary, and not available on technical grounds. Several problems of nomenclature are involved, as will appear.

Although there is no requirement that names of subgenera be retained and promoted to generic rank, *Oothisrinax* is not a difficult name, and it marks a distinctive character of the palm, the egg-shaped fruits, as already noted. Several other compounds of *Thrinax* have been used for related palms, as *Porothisrinax*, *Hemithrinax*, and *Coccothisrinax*, the last a rather pointless name since all of the members of the group have berry-like fruits. The word

Thrinax is defined in several of the older Greek dictionaries as a fan or winnower, in Latin *vannus* or *ventilabrum*, but these meanings are not found in Donnan nor in Liddel and Scott, possibly from not occurring in classical authors.

AN AFRICAN NICKNAME

The expression "latanier zombi" meaning "devil palm" is given as a Haitian name, from which "*Zombia*" was drawn. Plants as well as people often have nicknames in primitive communities. Any casual epithet that a native informant may have heard, or may invent on the spot, may be set down as a "native name." Any outstanding feature may suggest a name for a plant, and several such names may be found in the same neighborhood, as *latanier savane* and *latanier piquant*, other names for *Oothis* noted in Haiti by Professor Bailey. A spiny *Oothis* may seem "a devil of a palm," but so may any other spiny palm, as *Bactris*, *Acrocomia*, or *Astrocaryum*, in Haiti or elsewhere. Any troublesome plant may be called a "devil." These depreciatives are not distinctive names, only makeshifts that should not be perpetuated. Baillon in 1888 gave the name *Zombiana* to a West African shrub, possibly from its family relationship being difficult to determine, between the *Myoporaceae*, *Verbenaceae*, and *Scrophulariaceae*. Some would argue that *Zombia* and *Zombiana* are "sufficiently different" to be kept, but one genus thus dedicated may be sufficient. Otherwise we may have *Zombina*, *Zombica*, *Zombella*, or others, running into a series like *Engleria*, *Englerina*, *Englerella*, and the seven other Engler compounds reproduced in the October, 1939, number of this magazine.

The effect is that the repetitive names do not have distinctive values, but cause

confusion. There is need to revert to the time-honored rule of requiring names to be appreciably different, not merely in gender, connecting vowels or derivative endings, but words distinct in form and meaning. On account of the patronymic endings used in forming names of tribes, families, and orders, it is more difficult and confusing to deal with generic or specific names differing by such endings.*

A BORROWED SPECIES NAME

The specific name *antillarum* is adopted by Professor Bailey from Descourtilz, "Flore Pittoresque et Medicale des Antilles," 1833, without recognizing a previous association with *Mauritia flexuosa*, by Humboldt, Bonpland, and Kunth, in 1815. The expression "*Latanier Antillarum*" is employed in a reference to Barrere's *Essai sur l'Histoire Naturelle de la France Equinoxiale*, p. 90, first published in 1741, reissued in 1749, where the palm named *Bache* in Guiana is said to be called "*Latanier aux Isles Antilles*." Thus Kunth's Latinized reference to Barrere, "*Palma radiata foliis palmatis, Bache Cayannensium, Latanier Antillarum*," apparently is the original of the name *antillarum* as applied to *Mauritia*, and it is in this connection that the name was used by Descourtilz. Nearly all of the definite data noted in

*The word *zombi* is of ethnological interest as a rare survival of an African word in America. The natives of Haiti had a similar word, *zemi*, for a spirit or image of the dead, to which the African word may have been assimilated. Another native word was *opia*, also referring to spirits of the dead. It was recorded by Ramon Pane in the time of Columbus, and doubtless was the original of *obi* or *obeia*, now connected with the negro superstitions in the West Indies. Such survivals doubtless resulted from negro slaves escaping to the Indians in the mountains and adopting their ways of living. The methods of using cassava are of Indian origin, and the habit of living in separate scattered families, not in compact villages as in Africa. The natives of Haiti appear to have had the highest civilization in the West Indies, and the most specialized system of agriculture, based on South American plants, as recognized by Sven Loven in "Origins of the Tainan Culture," 1935. An additional South American root-crop, *arracacia*, is cultivated in northern Haiti on the higher slopes of Morne Sale, under the name *panem*, not previously recorded.

his essay relate to *Mauritia*. A few features are borrowed from other palms, but nothing is said that would connect the name *antillarum* with the Haitian palm now called *Oothis*.

A height of 15 to 20 feet is specified by Descourtilz, a trunk about 20 inches in diameter, coarse spines at the insertions of the leaves, as occurs in some of the species of *Mauritia*, and strong spines on the petioles as in *Copernicia*. Branched clusters of oval fruits are produced, of a deep red color, the size of lemons, and marked on the surface with smooth shining scales, unmistakably the fruits of *Mauritia*.

Other "synonyms" given by Descourtilz include a reference to Plumier, not to the diagnosis of *Oothis* published in the "Nova Plantarum Americanarum Genera," 1703, but to a palm that is "very spiny," in addition to the leaf-sheaths being armed. The strongest spines are on the surface of the leaf-sheaths in many of the cocoid palms. Descourtilz also has a statement of "generic characters," specifying a deeply three-parted calyx, a corolla of three petals, three pistils, and three pulpy fruits, each of these characters definitely excluding *Oothis*, with its suppressed perianth and simple pistil. The general account begins with a scene from Bernardin de Saint Pierre's "Harmony of Nature," of fan-palms beckoning travelers from rocks on the seashore, and furnishing from their seeds a coarse bread for the "negres marrons" in their "mountain retreats," presumably those visited in the Isle de France and described in "Paul and Virginia," that island and Bourbon having been Saint Pierre's only contacts with the tropical world.

A COMPOSITE PALM

In the Antilles the palm is said to occur in various places, on the banks of streams and ravines, in sterile, dry

savannahs and in marshy districts, thus combining the habitats of *Sabal*, *Copernicia*, and *Mauritia*. The use of petioles of the leaves for forming the upper rims or gunwales of the native canoes is noted, as described by Aublet in 1775 for the *bache* palm in Guiana, with the figure of the fruit of *Mauritia*. Since the petioles of *Latania* and *Mauritia*, like those of *Oothis*, are entirely unarmed, *Copernicia* would seem to have figured with Descourtilz, and this is confirmed by his mention of "Carnaiba," the wax palm of Brazil, with mention of Piso and his date of publication, 1658. Descourtilz considers the petiole spines as a variable character, and his illustration shows one of the petioles with rather regular coarse teeth, as in some of the species of *Copernicia*, while the other petioles appear smooth.

The name *Antillarum* is given by Descourtilz as though it had been used by Linnaeus, "Synonymie. *Chamaerops Antillarum, ou Palmier en eventail de Linne, append., order des Palmiers.*" The name *antillarum* does not appear in Richter's Codex of Linnaean names, nor in the "Supplementum Plantarum." It doubtless was used by Descourtilz merely to show that the native European *Chamaerops* was not intended. Kunth had a Mexican palm under *Chamaerops* and the palmettos of our southern States also were assigned to that genus. In most of the works of Linnaeus the palms are placed as a separate section at the end of the book, with *Chamaerops* at the head of the series of fan-palms, or "*Flabellifoliae*," so that the reference may have only this general significance, or it might relate to the "Supplementarum Plantarum" of the younger Linnaeus, 1781, where the genus *Mauritia* was established.

The question raised by Professor Bailey, of admitting the work of Des-

courtitz as "binomial literature," is misleading, since it assumes that *Oothis* was the palm treated by Descourtitz. In reality the chapter is a confused account of three or four other palms, with nothing to show that the existence of *Oothis* was known or even suspected by Descourtitz. That Plumier's drawing of *Oothis* may have served with Descourtitz as a pattern for his fanciful composite sketch may seem probable, but hardly affords a reason for transferring the name *antillarum* to *Oothis*.

The spiny trunks of *Mauritia* and the spiny petioles of *Copernicia* apparently were confused with the spiny leaf-sheaths of *Oothis*, but all of these fan-palms have narrow tubular spathes, so that another origin must be sought for the broad valvate spathe depicted by Descourtitz, in his plate 28. An example of borrowing by Descourtitz may be seen in his plate 22, where the spathe of the coconut palm is represented by Plumier's drawing of *Bornoa*, published in 1703 and reproduced in this magazine, January, 1940. Also the flowers and the nut of the "coconut" obviously came from other drawings of *Bornoa* by Plumier, which Burret has reproduced. One mistake or another would not vitiate any first-hand effort to describe a plant, but there is nothing to show that Descourtitz was attempting more than a picture-book.

A CARIB PALM NAME

The mention by Descourtitz of the Carib name *alattani* might be supposed to indicate the location of the palm to which the Latin name *Chamaerops antillarum* should apply, but this reckoning would exclude *Oothis*, since the Caribs lived only on the Lesser Antilles, while the palm is found only in Haiti.

Breton's Carib Dictionary, published in 1665, recorded the name *alattini*, not

in alphabetic sequence but under *hue hue*, the Carib word for tree. Breton lived at Guadeloupe as a missionary to the Caribs, and his dictionary was prepared in the early years of the French settlement, while the Caribs were still numerous. The French colonization of the West Indies began at St. Christopher in 1627, followed in 1635 by Guadeloupe, Martinique, and Tortuga, "the home of the buccaneers." San Domingo was occupied 30 years later. The French had no contact with the peaceable Taino inhabitants of San Domingo, who had been enslaved and exterminated during the Spanish period, a century before, but no Spanish settlements were made on the Carib Islands.

Breton's brief account of *alattani* shows that the palm was not *Oothis*, the trunk being thick enough to be used for gutters or spouts, "since it is naturally hollow," possibly meaning that the pith was easily removed. The leaves served as umbrellas and for roofing the native houses, indicating a palmetto. *Copernicia* is not known to occur in the Lesser Antilles. Textile uses of the leaves of the *latanier* for weaving hats, mats, and baskets are noted by other early writers. Several other words of the Carib language were adopted by the French colonists, as *ouragan* and *boucan*, the originals of hurricane and buccaneer.

LATANIA A TRANSFERRED NAME

The word *latanier* passed to other French colonies as a general name for fan palms, and in Latin form, *Latania*, has served with many writers as the generic designation of a group of fan-palms inhabiting the Mascarene Islands in the Indian Ocean, east of Madagascar. The transfer of the name from the West Indies has been overlooked. Bescherelle's French dictionary derives the name *latanier* from Madagascar and the Sunda Islands. In

the dictionary of the Spanish Academy, *Latania* is stated to be an indigenous name in the island of Bourbon, as though a native race had existed there, but none of the Mascarene islands was inhabited in advance of European settlement. The palm was discovered by Commerson, botanist of Bougainville's "Voyage Round the World," 1766-1769. Commerson was left at l'Isle de France in 1768 for further exploration of the islands. The palms already were reduced by the leaves being used as roofing material, as noted by Saint Pierre, "The *latanier* is a large kind of palm tree, it bears at the top one leaf only, in the shape of a fan, with which they cover their houses." Saint Pierre visited the Isle of France in 1768-1770, and made it the scene of "Paul and Virginia," published in 1789, at the opening of the French Revolution.*

PROBLEMS OF NAMING PLANTS

That botany should run into such complications may lead us to ask "why?" The questions arising in the placement of this single palm afford illustrations of several problems of nomenclature that need to be studied with

actual cases in mind, to let us see our futilities. The methods used in the past have tended to make botany an over-technical, closed science, declining in popular interest and gradually losing its place in the school system. The physical sciences have gained a dangerous preponderance in popular interest and attention, which now is resulting in serious dislocations of our intelligence and our ways of life. "Are not our geniuses now arrayed under the banner of mechanics, while the gardens of art lie parched and barren?" And are not the gardens of botany languishing even more from dearth of talent? Eminent chemists, physicists, and astronomers are known, but who in this generation has heard of an eminent botanist? People posed to name one mostly might answer "Burbank."

Defining science as "the activity of the pure reflective intellect" even excludes the biological sciences, since these arise primarily from the perceptive intellect, the interest to see the world of plants and animals. Botany, because the visual sense is exercised, is closer to art than to the sciences built in forms of logical inference. The service of science is said to lie in "complete detachment from the instinctive life. its complete uselessness, its abiological nature," as though a dangerous disturbance of the "intellect" must be feared from looking at anything alive, or at anything supposed to be useful. Turning away from the visible world of nature obviously is subverting human intelligence.

The biological disciplines are needed for a constructive approach to the problems of adjustment in human relations. Not only results of botany are useful, but botanical study in itself is of human value. The classification of plants and animals is the greatest structure of thought that the human mind has erected, begun by Aristotle and Theophras-

*The Genus *Cleophora*. The name *Latania* as applied to the palms of the Mascarene Islands was defective for another reason than that of being borrowed from a West Indian palm. The genus *Latania* first appeared in Jussieu's "Genera Plantarum," 1789, but with no mention of a species, so that Gaertner in 1791 would appear to be justified in disregarding Jussieu's reference to Commerson's manuscript name *Latania* and applying another name, *Cleophora*.

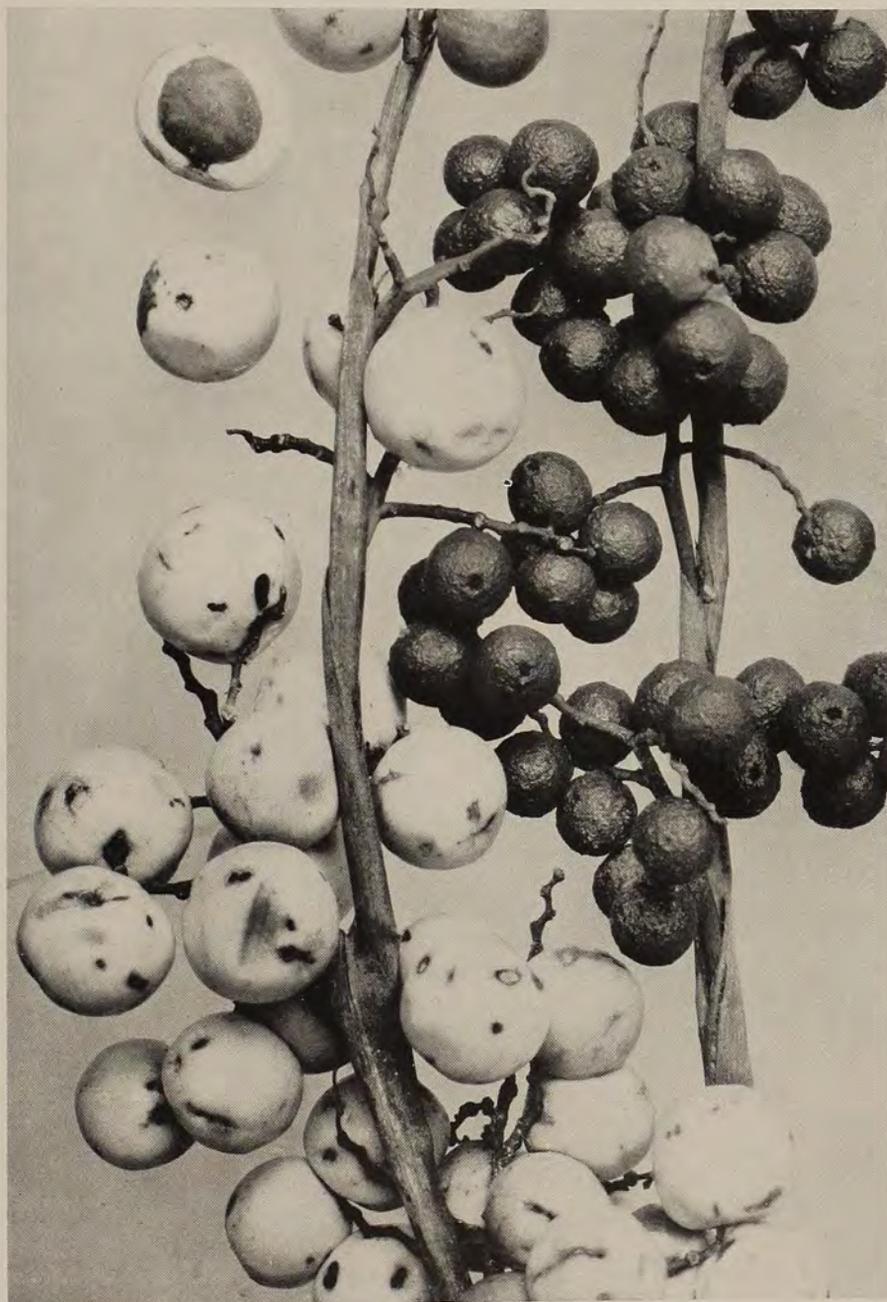
Gaertner's type species, *Cleophora lontaroides*, was noted as the "*latanier rouge de l'Isle de France*," with the nuts nearly smooth. Jussieu's *Latania*, known through Commerson and said to have come from the island of Bourbon, was named *Latania commersonii* by Gmelin in 1796, and would stand as *Cleophora commersonii* (Gmelin). The broadly obpyriform nuts are figured by Martius as distinctly costate and somewhat reticulate.

A third species, *Cleophora loddigesii* (Martius), with heavily pruinose leaves and an open network of raised fibers on the nuts, is confined to three small islands near Mauritius. A fourth species, *Cleophora verschaffeltii* (Lemaire), with the nuts spiny and crested, is a native of Rodriguez, an island about 350 miles northeast of Mauritius. These strikingly colored palms are well known in conservatories and are now being grown in southern Florida. Dammer reports the first leaves of *commersonii* and *loddigesii* as "fan-shaped with deep sections." The seedling figured by Jackson, Mem. Boston Soc. Nat. Hist. 5:6.23, 1895, probably represents *Livistona*.



H. F. Loomis

*Fig. 7. Leaf-sheaths, trunk sections and young fruits
(Natural Size)*



H. F. Loomis

*Fig. 8. Mature and immature fruits
(Natural Size)*

tus, and the work resumed at the Renaissance. The diversity of nature is the basic fact of scientific interest, still to be comprehended and assayed. The knowledge of kind is essential to biological understanding of social adjustments and racial relations. The endless diversities of races, sexes, families, and individuals are not to be constructively appreciated without the biological background that botany opens to us. The fundamental applications of the biological sciences must await this wider interest and insight, to be gained through botany. Plants are more accessible to study than animals and are the supporting environment of the animal world. The educational function of botany as the normal entrance to the other sciences is not being exercised. Botany is necessary to an enlightened public interest, and should be made accessible to popular understanding.

Agriculture is a branch of applied botany, and also is a life to be lived in the world of plants. Plant introduction can do very little for people not interested in plant life. Urban industrialism is not the solution of human welfare, nor rural industrialism, which may be equally squalid. The normal rural life must be envisaged and maintained as the central need in social progress. Plants are a normal interest of normal people, that the schools should not inhibit, nor the professional botanists. Every intelligent person should have, by way of "background," a general outlook on the plant world, and know how the knowledge of plants has developed.

An underlying reason may be seen why the study of plants has been casual, because the educational and social values of plant knowledge have not been appreciated. Collections, catalogs, and name-lists are technical facilities, but not the primary interest. The

names are not merely for indexing, but are an essential part of botany, to be understood and appreciated. Even among those not working as specialists, but conscious of a continuing interest in the study of plants, the need should be felt of giving attention to the problems of providing suitable names, at least to the extent of knowing that such problems exist and are worthy of study.

HERBARIUM OUTLOOK LIMITED

Millions of pressed specimens have accumulated in our "reference herbaria" and the care of these collections is one of our "scientific occupations." If herbarium workers alone were concerned, and names were needed only for filing the herbarium sheets, the names might be treated arbitrarily, like numbers, letters, or symbols. Closely similar names like *Thrinax argentea* and *Thrinax argentata* cause only slight difficulties in alphabetic arrangement of labeled specimens or index cards, but in field or garden use, or for the general purposes of study, instruction, or conversation, nearly identical names are an imposition. Keeping such names as *argentea* and *argentata* correctly remembered and designated is a difficult feat, requiring such special attention, from speaker and hearer alike, as to interfere with any other interest or observation. Every written or printed reference to either of the species must be specially guarded and checked, to avoid the inevitable "slip" always to be expected. Instead of assisting scientific understanding, such names impose needless handicaps on the study of plants.

Alphabetic filing also finds little difficulty with another class of confusing names, those that misstate the country of origin, like *Asclepias syriaca* and *Simmondsia chinensis*, for plants not represented even as genera in Syria or in China, but natives of the United

States. Such species go wrong in geographic herbaria and confusion is created in reference works. On account of the name *syriaca* the common milkweed of New England is included in a German treatise on Asiatic sources of rubber, and acquires a false bibliographic status as an oriental plant.

Even among professional botanists many are becoming aware of the consequences of using definitely erroneous and misleading names. Serious misgivings are expressed by experienced workers, the following by Hall and Clements in "The Phytogenetic Method in Taxonomy":

"Thousands of names have no further justification than the caprice of the describer, and hundreds of them are lacking in every canon of convenience and good taste. Indeed, taxonomy is the only field of science in which the blunders and banalities of the indifferent and incompetent are respected and perpetuated."

Not only taste and scholarship are offended by retaining the bad names. No end of petty trouble is created in the effort to save the errors from being corrected, or in setting people "right" with names that are palpably wrong, like *Asclepias syriaca* and *Simmondsia chinensis*. A barricade of quibbling obstructions interferes with the study of plants. Names that misrepresent and mislead, requiring constantly to be explained and defended, are not an aid to science, but an impediment. The silly names alienate interest. Who could have the same regard for a plant after being told that its "scientific name" is *Lablab lablab*?

The notion of treating names as arbitrary symbols without regard to form or meaning, proves not to have been a bright idea. The fiasco with the vitamins is a current example of many such

schemes. Naming with names is the only method that works out constructively. In words ascribed to the great Porson, "Authority should serve to excite attention, and no further." Only misuse of authority can be seen in holding to "blunders and banalities."

The excuse for keeping the bad names is that they are supposed to be necessitated by the principle of priority, requiring the first available name to be used in the interest of stability. By general consent of botanists, duplicate names, known as *homonyms*, are not considered available, but neither should it be supposed that the *misonyms*, the defective, misleading names, must be used, that should be left in oblivion. It is the essence of science to correct errors, but no scientific purpose is served in exhuming an abortive name like *antillarum* to replace a current designation.

Retaining the bad names is making of priority a mere fetish. *Hicoria*, the generic name of the hickory tree, proposed by Rafinesque in 1808, was printed *Scoria*, but even the zealous prioritarrians do not restore this spelling. The author doubtless wrote *Hicoria*, and the lapse was the typesetter's, but why deny to authors the mercy of amendment? Keeping our predecessors locked forever in the stocks is ungracious, and the task of rehearsing the ancient errors anew to each generation of beginners is burdensome and barren.

RESPECT FOR VERNACULAR NAMES

Other cases of chronic confusion are caused by borrowing vernacular names in wrong applications. The use of *Latania* as a generic name in the East Indies naturally gave the impression of its being derived from an East Indian language, and even the lexicographers were misled, showing how misplaced names generate other errors.

The vernacular names have a true priority of use which technical botany should not attempt to set aside, either casually or deliberately. Referring to such mistaken names as "scientific applications" only makes botany seem more hopeless to the layman.

Herbarium workers may be entirely indifferent to the uses of the names among the "natives" of the different countries, but for all related sciences, as philology, ethnology, and pharmacology, the aboriginal names are the chief concern, and it is futile for taxonomy to run counter to other interests in the study of plants. The widening scope of science shows us where wrong courses were taken. The "usability" of names, as Hall and Clements have observed, is worthy of more attention than "a fugitive stability derived from rules."

Facts of many kinds must be considered, regarding the plants and regarding the names, in determining which names should be used. The study of the names is a part of the study of the plants, not to be divorced as a separate specialty. The methods of naming plants are in need of scientific study, deliberate, comparative, experimental study, like other scientific problems of the structure, behavior, and evolution of plants. Problems are solved through better understanding, that leads eventually to practical agreement.

The notion of short-circuiting the study of the plant names by arbitrary controls is as out of place in botany as in other sciences. The assurance given with some of the casual proposals of nomenclatorial reform, of the names being permanently stabilized after a brief check-over, show plainly enough that the problems were not appreciated. It is not in the nature of the taxonomic system to be reduced to a final "standard" list of names. It has the advantage of a card index of readily receiving

and incorporating new knowledge, by adding and modifying names. Large numbers of palms as of other plants remain to be discovered and assimilated into the system. Obviously, there can be no assurance of any individual, committee or commission being able to foresee all the questions that may arise, or of being able to determine in advance the results that might be reached through adequate study. A lack of clear understanding no doubt is responsible for current confusion among technical workers, and is to be obviated only by giving more critical attention to the problems.

BECCARI ON OOTHRINAX

The original description of *Coccothrinax anomala* in Fedde's Repertorium 6:95, November, 1908, was drawn from herbarium specimens collected in Haiti by W. Buch, pharmacist at Port-au-Prince, well known as an amateur botanist and kindly patron of botanical explorers in Haiti. Only the foliage and fruiting stage appear to have been represented in this material.*

Beccari's description was supplemented by drawings published in 1931 in the Annals of the Royal Botanic Garden, Calcutta, plate 31V. Many details are shown, but the explanation is mis-

*The leaves were noted as forming three-quarters of a circle, with about 35 segments, about 50 cm. long, silvery underneath, not punctulate; the segments closely nervose-striate with very short cross-veins slightly prominent on both sides, the margins distinctly thickened; median segments free to 18 cm. from the base, or sometimes 8-10 cm., at the fissure 20-25 mm. wide, very gradually narrowed to a stiff point, slightly split; petiole slender, much longer than the blade, lenticular in cross section, the edges sharp.

Inflorescence slender, 45 cm. long, about 6 mm. wide at base, with 5-6 small primary divisions sparsely branched; the spathes tubular, scarcely broader above, obtuse at the apex and often split, the fruiting branches rigid, 3-4 cm. long, 1.5 mm. thick, the fruits sessile, alternate in two rows, the calyx apparently 6-toothed, the filaments 12, very minute, dentiform, thickened at the base.

Fruits not fully mature, ovate, about 2 cm. long, 15 mm. wide, the apex rather acute, the stigma very minute, immersed in a narrow pit; mesocarp sparingly fleshy, endocarp thin, grumous-woody. Seed ovate, cerebriform, almost divided with two irregular primary lobes, these more or less split into secondary lobes; embryo lateral, a little above the middle.

leading, figures 1 and 2 being noted as the "superior part of the fruit," while in reality representing the basal part. The longitudinal section, figure 3, shows the parts in their true relation. The circle of clawed protuberances, instead of being associated with the style, is an accrescent staminal ring connate with the base of the fruit, surrounding the rudimentary 6-angled perianth, as the drawing shows. Such a fusion and incorporation of the stamens with the pistil has not been noted in other palms, and may be a peculiar feature of *Oothis*, though less astonishing morphologically than new outgrowths at the summit of the fruit.

The embryo also is somewhat misplaced in Beccari's figure and description, as might easily occur in working with dry material. Instead of a lateral position, the embryo is definitely ascending or subapical, in a very broad short chamber roofed with a thin layer of white endosperm tissue, in a conical section of the endosperm projecting toward the middle of the seed. The limited material no doubt explains why Beccari published *Oothis* only as a subgenus, although he noted that the palm was "outstanding among all its congeners thus far known by its comparatively large ovate fruits, deeply bilobed seed, and lateral embryo." This statement would seem to have been overlooked by Professor Bailey in reporting that Beccari's subgenus *Oothis* was a *nomen nudum*, as a reason for replacing *Oothis* with *Zombia*.

TRUNKS AND LEAF-SHEATHS

Trunk slender, columnar, tapering gradually, from 5-6 cm. to 3.5-4 cm., the upper leaf-scars shorter, 1.5 to 2 cm. apart, as in figure 7. Surface of young trunk-sections covered with a dense light-brown tomentum. The base of the trunk is surrounded by a specialized root-cushion (rhizotyle) formed

of a loosely interlaced mass of dark purplish spiny roots, at first simple and needle-like, often attaining 20 cm. in length and 2 mm. in diameter near the base, in the basal half producing numerous irregular branches, some nearly equal to the main axis, some very slender, like stiff bristles. The roots have a tough central core and a hard brittle shell, with a soft layer between, of rather woody texture, the branches rising from the core and rupturing the shell.

Leaf-sheaths forming a network of coarse interlaced diagonal fibers with a rather regular median line of decussation, shown in natural size in figure 5. Opposite the petiole the sheath projects as a large antiligule with a specialized structure of long needle-like spines, at first erect and parallel, as shown at the upper left-hand corner of figure 7, then gradually separating and diverging, finally deflected, as in figures 1, 2, and 3. The spines number about 25 on each side of the median line, attaining 10 cm. in length, 2-3 mm. thick at base, the series of leaf-sheaths in figure 3 less than half natural size. The outer surface of young leaf-sheaths is covered with a fine appressed tomentum, notably less developed than in *Thrinax* and *Coccothrinax*. The margin of the young antiligule has a close fringe of long hair-like scales, that entirely disappears with the separation of the spines.

Petioles as in figures 4 and 6, very slender, convex on both sides, lenticular or trapezoidal in cross-section, more prominent above than below, slightly broader near the end, not distinctly widened and roughened on the margins as in *Coccothrinax garberi*, figure 4.

DEVELOPMENT OF LEAF

Ligule 1 cm. or less in length, nearly 2 cm. wide, broadly trilobed or auricu-



R. L. Taylor

*Fig. 9. Juvenile foliage of potted plant
(Slightly Reduced)*



R. L. Taylor

*Fig. 10. Aerial roots of juvenile plant
(Natural Size)*

late, as a whole much wider than the petiole, the triangular median lobe narrower than the petiole. As shown in figure 4, the low diverging lateral lobes are nearly as wide as the median lobe in the mature leaf, and they are wider than the median lobe in young unexpanded leaves. At that stage the margins of the lateral lobes are densely fringed with brown scales, and are continuous with the margin of the lowest segment of the leaf.

Subligule distinct, of indurated texture like the ligule, very broadly triangular, forming a transverse rim continuous at the sides with the inferior vein of the lowest segment of the leaf-blade, near the middle abruptly longer, to nearly 5 mm., the median process about 4 mm. wide at base, narrowed to less than 2 mm., the blunt apex somewhat recurved, as in figure 6, often wider and longer than in figure 4. The margin of the subligule, on young leaves, is densely fringed with brown scales, as on the ligule. The subligule of *Coccothrinax garberi*, at the right of figure 4, is not a transverse rim, but a sharp median prominence.

Leaf segments split at the tip, the upper surface, in figures 5 and 6, finely and rather irregularly veined, larger and smaller veins not evenly spaced or alternated, the margins of the segments distinctly thickened, the lower surface whitened with a very fine, closely appressed tomentum. Dried specimens of young leaves show many short cross-veins, distinct on both surfaces.

MIDDLE SEGMENTS UNITED

It was noted at Coconut Grove, Florida, by Mr. Harold F. Loomis that the two middle segments of the leaves often failed to separate, except a little at the tip. Two specimens of such leaves were sent to Washington, from which it appears that these connate segments, though not a regular feature,

are definitely specialized. The superior vein that unites the two segments is thinner and less prominent at the base of the leaf than the other superior veins, as seen in figure 4, from a leaf photographed in Haiti. That the thinner vein marks the middle of the leaf is shown by an equal number of segments on each side, 18 in one leaf and 23 in the other. Another peculiarity is that the united segments are not symmetric, the side that remains united a centimeter wide, the other side 1.5 cm. The wider side is different also in having a distinct submarginal vein, as do other neighboring segments that are not united. The double segment of the larger leaf was 5.3 cm. wide, the adjoining simple segment 3 cm. The segments were united for 48 cm., but separated near the end for about 3 cm.

The second segment from the middle may be deeply separated, or a deeper separation may occur between the second and the third segment, with the following segments united much further up, to about half the length of the leaf. The lengths of the superior veins that unite the segments on one side of the leaf, including the middle vein of the united segments, measured in centimeters: 48, 20, 4, 23, 14, 22, 20, 14, 20, 11, 11, 7, 15, 13, 8, 7, 11, 10, 9, 5, 6, 4, 3. The series for the other side began as follows: 48, 5, 21, 20, 17, 10, 10, 18, 15, indicating that the unequal grouping of the segments in the juvenile leaves is continued to a less extent in the leaves of older palms.

INFLORESCENCES AND FLOWERS

Inflorescence slender, the lower joints, shown in figure 7, thin and flattened, the basal joint rather short, not crassate, 1.5 cm. long, 2 cm. wide at base, 1 cm. at apex; second joint 1.5 cm. long, 1 cm. wide; first spathe 4.5 cm. to 6.5 cm. long, 1.3 cm. wide, rather narrowly and weakly bicarinate, the

carinae about 2 mm. wide; second spathe 11-13 cm. long; third spathe 17 cm. long, the others gradually shorter; lowest branch emerging from the fifth spathe. Basal joint of primary branch 8 cm. long, not adnate to the axis above the insertion as marked by the spathe; basal joint of lower primary branch 8 cm. long, the spathe 5.5 cm, the tubular part 4.3 cm.

The basal joint of the inflorescence is adnate to the leaf of the supporting trunk section to the extent shown by the transverse scar in figure 7. The other side of the same joint is adnate for more than half its length to the surface of the trunk-section. The lower joints of the inflorescence appear to be naked on the outer face, with the spathes decurrent on the sides of the joints. The lowest spathe apparently did not cover the outer face of the lower joints, at least in the specimen that was photographed, but in another specimen is complete.

Primary branches of inflorescence 7-8, their spathes mostly concealed, compressed and distinctly bicarinate, the carinae broader above and the end deeply bilobed, the angles narrow, attenuate, often emerging above the primary spathes, as in figure 6. Lower primary branches 20-25 cm. long, about 15 cm. to the first secondary; 6 to 8 secondary branches; all simple, attaining nearly 4 cm., the branching axis 4.5 cm. long. Surface of secondary branches uneven, sometimes minutely scabrous.

Flowers distichous and regularly alternate, usually 6-7 on each secondary branch, sometimes 9 or 10, on very short pedicels, the branches and the individual flowers subtended by rather large triangular scarious bracts. Stamens 5 mm. long, the anthers oblong, nearly 5 mm., less than 1 mm. wide, attached near the base, the pollen cells scarcely separated, the filament very

short and slender, less than 1 mm.; pistil 3.5 mm. long, the ovary conic-ovate, nearly 3 mm. long, less than 2 mm. wide, surface closely beset with prominent vertical crests or ridges of fused caruncles, the crests numbering about 12, but often joined or interrupted; style rather short and thick, the stigma somewhat capitate. The conic form and specialized surface sculpture of the pistils are notable features. Without the vertical ridges the pistils would appear even narrower than in figure 6. This photograph was made at Port-au-Prince April 23, 1926, from a specimen in Ekman's collection, No. 4570, from the district of Port-de-Paix, "Vallee des Trois Rivieres."

FRUITS LIKE SNOWBERRIES

The immature fruits shown in figure 7 are of nearly the full length, but narrow and fusiform, at maturity becoming nearly spherical, the diameter increasing to about 1 cm., the apex showing a distinct depression, as in figure 8, around the short persistent style, the flesh finally swelling and turning white like the shell, the fruits then attaining 2 cm. in diameter, the seed 1.3 cm., the layer of white pulp 2-4 mm. in thickness. Surface of dried immature fruits with surface roughened by rather regular ridges, at the base with a circle of 12 tubercles formed by the accrescent staminal ring and persistent filaments. With the maturity of the fruit the thin exocarp becomes evanescent, exposing the swollen white endocarp, this with a soft flesh inside, resembling that of the snowberry, *Symphoricarpos*. The flesh disappears in drying, leaving an empty space between the shell and the seed, crossed irregularly by a few white fibers. The shell has a rather loose columnar structure, the surface appearing somewhat alutaceous but not distinctly pebbled like the shell of our native

needle-palm, *Rhapidophyllum*. The white color of the fruit is in contrast with all the species of *Coccothrinax*, which have purple or black fruits. *Thrinax* and *Simpsonia* have white fruits, also *Acanthorhiza*.

The fruits matured in Haiti at the end of August, and the same period of development is indicated in Florida. Several small plants were brought home, with about 100 seeds, some of these germinating within a month.

JUVENILE CHARACTERS

A greenhouse plant is shown in figures 9 and 10, with roots, leaf sheaths and leaf-blades different from those of adult palms. The leaf segments of the young plant are united in irregular groups of 2 to 5, while the leaves of adult palms are evenly divided to below the middle. The groups are determined in the formation of the leaf, the sinus being marked before the leaf opens, by a thickening of the superior rib, ending abruptly in a minute prominence colored deep yellow or brownish, located one mm. or less above the ligule. The other superior ribs are not thickened at the base, and do not split. The segments are distinctly notched at the tip, for 2-3 mm., and the broader groups of segments are toothed or praemorse at the end.

The margin of the lowest segment often is excurrent as a slender fiber 5-6 cm. long, at first united with the tips of the adjacent segments. The lower surface appears glaucous, from a slight tomentum on the surface between the veins. Cross-veins are not shown on the surface of the living leaves, but appear somewhat transparent against the light. The ligules of the juvenile leaves do not have the specialized lateral lobes, but form a continuous flange connecting the indurated bases of the lowest segments.

The slender aerial roots of the young

plant, the finer about 1 mm. in diameter, form an open tangle above the soil surface, later becoming a dense turf or cushion, readily absorbing moisture and enabling the palm to live on thin sterile soils or bare rocks. The roots near the ground are very fine and flexuous, about 1 mm. in diameter, becoming coarser above, also straight, stiff, and needle-like, 4-5 cm. long, 2 mm. in diameter. The color of the roots is a dull purple.

Similar root-cushions are formed in *Thrinax* and *Coccothrinax*, and such formations are even larger and more specialized in *Simpsonia*, shown in Professor Bailey's illustrations as *Thrinax microcarpa*, "Gentes Herbarum" 4:145. The Central American genus *Acanthorhiza* has a basal root-cushion but passing gradually into an armature of spiny branching roots, extending far up the trunk. The specialized leaf-sheaths of *Ooثرinax* may be considered as replacing the upper part of the root-cushion of *Acanthorhiza*.

LIST OF SUGGESTED NAMES

For reasons given in the discussion, several new names and combinations are suggested. *Ooثرinax* is treated as a genus instead of a subgenus, with *Ooثرinax anomala* (Beccari) as the type species, the name *Zombia antillarum* Bailey not being applicable. Other new names are as follows:

Acanthorhiza argentea (Loddiges), Panama. *Thrinax argentea* Loddiges, Schultes Syst. Veg. 7, 2:1300. 1830.

Acanthorhiza collinsii new name, Guatemala, *Cryosophila argentea* Bartlett. Carnegie Inst. Washington Publ. 461:40. July, 1935.

Antia, new genus, Cuba, type *Antia crinita* (Grisebach and Wendland), *Thrinax crinata*, Sauvalle, Flora Cubana p. 152, 1873. *Coccothrinax crinita*, Burret, Kungl. Svenske Vet. Akad. Handl. 3, 6, 7:16. 1929.



H. F. Loomis

*Oothenax at Coconut Grove, Florida,
with seven clusters of fruit in 1940.*

Beata, new genus, southern Haiti, type *Beata ekmani* (Burret). *Coccothrinax Ekmanii* Burret, Kungl. Svenske Vet. Akad. Handl. 3, 6, 7:11, 1929. Fairchild, David. Nat. Geog. Mag. Dec. 1934, pp. 705 and 710.

Cleophora Gaertner 1791, an authentic name for palms of the Mascarene Islands, replacing *Latania* Jussieu, 1789. Type species *Cleophora lontaroides* Gaertner, from Mauritius. The transferred species are *C. commersonii* (Gmelin), from Reunion; *C. loddigesii* (Martius) from Round Island, near Mauritius; and *C. verschaffelti* (Lemaire), from Rodriguez.

Coccothrinax baileyana, new name, Dominican Republic, *Coccothrinax argentea* Bailey, Gentes Herbarum 4:248, 1939.

Pithodes, new genus, from the Dominican Republic, type *Pithodes spissa* (Bailey), *Coccothrinax spissa* Bailey, Gentes Herbarum 4:253, 1939.

Thrinacaceae, new family, West Indian palms with palmate leaves, bisexual flowers, suppressed perianths, simple pistils and expanded stigmas.

Also a new term, *rhizotyle*, for cushions of superficial roots in many palms, a specialized feature of the *Thrinax* family, notably in *Simpsonia* and *Oothis*.

A Few Hybrid Crabapples

DONALD WYMAN

The crabapples hybridize freely. Only two are known to be apparently apomictic, *Malus toringoides* and *M. hupehensis*. The remainder when grown in large collections cross indiscriminately and, as a result, there are many hybrid forms, some being offered under correct names, other masquerading under the names of totally different species or varieties, creating a disconcerting problem. The Arnold Arboretum, for instance, has 148 species and varieties. Mr. A. F. den Boer of Des Moines, who has made a hobby of growing crabapples, has 183 species and varieties listed in his plantings in Des Moines. With such a large assortment there is bound to be cross hybridization. The Arnold Arboretum has become intensely interested in this group of plants and has created approximately several thousand hybrids during the past three years, many of which have been distributed among gardeners close

by for careful examination, others of which have been planted on the Arboretum grounds for close examination during the coming years. However, a few of the older hybrids are common, some being offered by the nurseries.

All these hybrids are, in effect, clones. The scientific name given to each group covers all the crosses made between the two parents concerned. Sometimes the garden enthusiast fails to keep this fact in mind. Take *Malus robusta*, for instance. Most of the crosses (*M. robusta* × *prunifolia*) have white flowers, yet the fruits vary widely. In the Arboretum some *M. robusta* trees have small, dark red fruits the size of a small cherry; others have fruits twice as large and colored beautifully—red on the side exposed to the sun, yellow on the side shaded from the sun. There is considerable variation in plants bearing the name *M. micromalus*, some having white flowers

and some having beautiful deep pink flowers.

Hence, it is advisable to keep in mind that the species names given to these hybrid crabapples are, in effect, *group* names, covering all the crosses between the two parents in question. Good trees in each group should be given horticultural variety names, be considered as clones, and be propagated as such. If all the nurserymen in the country would understand this and propagate such plants asexually, we would not be so sadly disappointed when the hybrid plants we have purchased fail to live up to expected standards.

Malus atrosanguinea: The Carmine crabapple is a hybrid between *M. Halliana* and *M. Sieboldi*. From *M. Halliana* it obtains its deep pink flowers; from *M. Sieboldi*, its hardiness. A low-growing tree, 10 feet or slightly more in height and similar to *M. floribunda* in general habit, its flowers are a deep carmine pink, fading only slightly until the time when they fall. Its fruits are dark red, about the same size as those of *M. floribunda* but not as colorful. It is frequently planted as a single specimen, but is far more effective when planted with *M. floribunda* as a background. The two bloom at the same time, and when one Carmine crabapple is placed immediately in front of two or three Japanese flowering crabapples, the effect at blooming time is one not easily forgotten. *Malus atrosanguinea* is common in nurseries, but because it is a hybrid, it should never be grown from seed.

Malus micromalus: Unfortunately, this is named the Midget crabapple, but there is nothing small about its stature, flowers or fruit when compared with those of *M. floribunda*. It is an oriental crabapple from Japan where it is known in gardens as a cultivated plant only. It was brought into this

country about 1865. Normally, it has deep rosy-pink flowers, not the carmine color of *M. atrosanguinea* but about the color of *M. Arnoldiana* flower buds. The flowers fade only slightly when fully mature. The fruit is larger than that of *M. floribunda*, soon turning a brownish color in the fall. It is distinguished from *M. spectabilis* by narrower leaves which taper into slender petioles, and from *M. baccata* by larger and more colorful flowers. The tree itself is upright in habit, rather dense and compact in growth, and makes an excellent specimen when used alone.

Malus purpurea: The Purple crabapple, a cross between *M. pumila Niedzwetzkyana* and *M. atrosanguinea*, is a much favored tree, being more upright in growth than *M. floribunda* and more graceful than *M. pumila Niedzwetzkyana*. It has flowers that are dark purple red, unlike those of any other flowering tree in the north except possibly those of the Redvein crabapple (*M. pumila Niedzwetzkyana*). The fruits are larger than those of most other oriental flowering crabapples, about $\frac{3}{4}$ inch long, and quite conspicuous in the fall. The veins of the leaves underneath are purplish, the fruit is purplish when cut, and even the wood of a small branch is diffused with the same purplish red color when sectioned. This hybrid originated before 1900 and since then several others with the same parentage have occurred. Most important of these are *Aldenhamensis*, *Eleyi*, and *Lemoinei*—all to be considered as clones and to be propagated as such.

The Aldenham crabapple (*M. purpurea Aldenhamensis*) is of rather doubtful origin, occurring in England about 1917. It differs from *M. purpurea* by having broader, thinner, and more glabrous leaves, and semi-double, purple-pink flowers. (It is the only one of this group with semi-double flowers.) The fruits are $\frac{3}{4}$ inch in diam-

eter and a deep purple red with persistent calyx.

The Eley crabapple was supposed to have *M. spectabilis* as one of its parents, but Mr. Rehder sees no connection with this species and so has placed it among the *M. purpurea* hybrids. It was first mentioned by W. J. Bean about 1920. The leaves are reddish when unfolding in the spring, and the entire aspect of the plant—foliage, flowers, and fruits—is one of deeper color than that of *M. purpurea*. Hence, it is decidedly ornamental. The single flowers are about 1 inch in diameter, and the fruits, dark purple-red in color, are nearly 1 inch long.

The Lemoine crabapple (*M. purpurea Lemoinei*, formerly *M. lemoinei* and *M. floribunda Lemoinei*) is the latest of these hybrids to reach America. It was first mentioned in the Lemoine catalogue of 1932. Specimens growing at the Arboretum show bronzy leaves and deep crimson flowers—the deepest in color of any of these varieties of *M. purpurea*. In Holland a cross has been made between Lemoine's crabapple and *M. Sieboldi* and called *M. Moerlandsi* by the originator. We have small plants of this cross now in the Arboretum but it is too early to say just what they will look like in flower and fruit.

Malus robusta: The Cherry crabapple (*M. robusta*) is the last of the hybrid groups to be discussed here. Crosses between *M. baccata* and *M. prunifolia*, these trees have pure white or pinkish flowers and the vigorous, tall growth of *M. baccata*. Often called Siberian crabapples, they are among

the hardiest of all, more than half a million of them being grown in Harbin and along what was formerly the Chinese railroad. They bear large numbers of fruits—sometimes dark red, sometimes red on the side exposed to the sun and yellow on the side shaded from the sun. Varying in size, the fruits of one tree in the Arboretum are nearly 1 inch in diameter. The variety *erecta* was raised from seed sent to this country by Professor C. S. Sargent in 1904 from Peking. It is of densely columnar habit, though slightly broad at the base. Its flowers are pure white and $1\frac{3}{4}$ inches in diameter; its fruit is bright red but frequently partly yellow and the calyx is always present. The variety *persicifolia*, introduced about 1910 directly from China, is also interesting for its long, narrow, peach-like leaves. Mainly a white flowering group of hybrids, the Cherry crabapples are more valued in ornamental plantings for their fruits. Varietal names should be given one or two of the trees with two-colored fruits in the fall, for these are really outstanding and, if propagated asexually, they should be an asset in any garden.

Other hybrids like the increasingly popular "Hopa" and "Dolga" crabs originated by Professor N. E. Hansen of South Dakota State College are being accepted by the nursery trade and widely distributed. Numerous others are occurring constantly and it is hoped that before long this very interesting and ornamental group of hardy flowering and fruiting trees will become much better known to the gardening public. *Arnold Arboretum*

Rhododendron Notes

CLEMENT GRAY BOWERS, *Editor*

The Flower-Spot and Blight of Indian Azaleas

Eight or nine years ago we heard alarming reports of a new disease attacking flowers of the old Indian azaleas in the famous gardens of the Charleston, S. C., region. The disease was new and hitherto unknown, it seemed to have serious potentialities and was very destructive to the beauty of the blooming plants. But we have heard little of it since that time. Now comes a scientific paper* from the pen of Dr. Freeman Weiss and his co-worker Dr. Floyd F. Smith, who have studied the whole matter and reported thereon. So far as I can judge, there is nothing alarming in the present situation. For those who may be interested but not disposed to read the full report, I have endeavored to extract the gist of the paper as follows:

This previously unknown disease first appeared in the region of Charleston, S. C., in April 1931. Initial symptoms are on the flowers as pallid spots or a freckled appearance, increasing rapidly until the flowers collapse three days later. First the size of a pin-head, the spots look pale on colored flowers and rust-colored on white flowers, eventually enlarging to irregular blotches. Upon collapse, the blighted flowers adhere limply to the twigs and foliage instead of falling naturally, producing an unsightly appearance. The disease infects only the flowers themselves and does not injure other parts of the plant. Thus it appears only at blooming time.

The causal organism is a new fungus, *Ovulinia azaleae*, related to the fungus *Sclerotinia*. It starts from a resting form, called a sclerotium, overwintering on the surface of the ground, which becomes active in early spring and develops a fruiting body from which spores (ascospores) are discharged into the air and find their way to the azalea flowers, presumably by air currents, since insects do not appear to be active transfer agents during this early stage. These ascospores may be continually discharged over a period of four or five weeks, during the season when the azaleas are in bloom. Landing on the flowers, if the moisture conditions happen to be suitable, the ascospores germinate and infect the flowers. From this point on, other flowers rapidly become infected through the agency of bees which visit the flowers and carry the secondary spores (conidia) which develop quickly and in enormous quantities on infected flowers. The disease multiplies so rapidly that it is not unusual for it to spread throughout an entire azalea planting in a nursery or on an estate within two weeks after a small primary infection. Sclerotia, or resting bodies of the fungus, eventually develop from the infected flowers and complete the final stage of the life cycle. These drop to the ground where they pass the winter dormant, until their activity begins all over again the next spring.

The disease is very sensitive to weather conditions and in weather unsuited for sporulation it may almost disappear. It has been found only in the Southeastern States, west to Houston, Texas, and north to Wilmington, N. C., on cultivated azaleas of the *Obtusum* subseries. In other words, it fol-

*Weiss, Freeman and Floyd F. Smith. A Flower-Spot Disease of Cultivated Azaleas. pp. 1-28; figs. 1-14. Circular No. 556. U. S. Dept. of Agriculture, Washington, D. C., July 1940. Price 5 cents.

lows the range of the cultivated Indian azaleas and seems to be found mainly on evergreen varieties.

Tests were made to determine the susceptibility of certain other types of azaleas and ericaceous plants. Under natural conditions, the Indian and Kurume sorts were most heavily infected, while the native azaleas were not infected at all except in rare instances when in close proximity to infected plants. Until there is more evidence to the contrary, azaleas and other ericaceous plants than those of the *Obtusum* subseries, need not be regarded as actual hosts to the disease, although when inoculations were made under artificial conditions practically all the species developed the disease. One might regard the forms of the *Obtusum* subseries grown in the North, such as *R. kaempferi* and *R. mucronatum* (*Indica Alba*), as potential hosts to the disease, but one does not know as yet that the fungus is capable of overwintering in the North. Among susceptible varieties were the well known greenhouse clones, *Vervaeneana* and *Mme. Petrick*. The fungus can also occur on *Rhododendron catawbiense* and *Kalmia latifolia* when grown in close proximity to infected azaleas. Artificial infection was produced on *R. carolinianum*, *Gaylussacia* and three *Vacciniums*, but the production of sclerotia from most of these is not proved.

Some of the spores can live a year under favorable conditions, but the effect of freezing weather upon them has not been ascertained. The disease spreads most rapidly under moist conditions and at temperatures between 50° and 70° F. The fact that it does not occur under greenhouse culture in the North is probably due only to its not having been introduced there.

Although not responsible for the initial transfer from soil to flower, bees

are important agents in transmitting the disease spores to other flowers, once infection gets started, and are known to carry spores as far as five miles away. Besides this, the disease is perfectly capable of transmission by wind currents or other means without the aid of insects.

The most effective control rests in preventing and destroying the disease organism in its overwintering (sclerotial) stage. For isolated plants, not likely to be infected again from neighbors, the complete picking off of all infected flowers as soon as the disease appears is a feasible method. Another is the complete removal of the winter mulch beneath infected plants, before spring infection starts, and its replacement with a fresh mulch known to be free from disease. Another fairly effective method is to apply a thick coarse mulch on top of the existing mulch four to six weeks after the dropping of the flowers; this prevents or reduces the production of fruiting bodies. The authors consider it dangerous to apply fungicides to the soil beneath the azalea plants, because of the shallow roots, but experiments are under way. Ordinary acetic acid, diluted from 1 to 1,000 up to 1 to 600, is the most promising spray for soil or for flowers. It is futile to spray the plants prior to blooming. Sulfur dust does not appear effective, and sprays are generally not very successful owing to imperfect coverage on the waxy flowers. Fair results have been secured from dusting with a copper-clay mixture, in frequent successive applications.

There is some danger of the disease spreading through the sale of infected flowers or blooming plants; hence, florists should pick off all infected flowers and buds before selling a plant. There is danger, too, of transmitting the disease through sclerotia present on

or near the surface of the soil of plants which are moved. However, the practice of nurserymen in cleaning off the superficial leafmold and litter from the rootballs of plants in commercial shipments, insures little danger of disease transmission through this source.

CLEMENT G. BOWERS

A Late-Flowering Azalea Race.

Under the name "Azalea indica macrantha hybrids" there first appeared in 193- in the catalogue of the Chugai Nursery Co., Yamamota, Japan, a series of plants which number 48 varieties in the 1939 listing. If one may judge from their general appearance, their season of bloom and their general behavior, they might appear to be a hybrid race between Azalea indica and Azalea macrantha or as we prefer to write it now, *Rhododendron Simsii* × *R. indicum*. Some weight may be given this surmise by the parentage given under the variety Shinnyo-no-tsuki which is reported to be the outcome of "A. indica Albert Elizabeth and A. macranthum" and again the variety Kikaku from "macranthum and Md. Morreux alba."

The Division of Plant Exploration and Introduction imported the set of eighty varieties in 1938 two plants of each but when flowering began some duplications were obvious.

The plants were placed in a pit greenhouse where there was only enough heat to keep out freezing temperatures, in order to safeguard varieties for which hardiness was believed to be doubtful. In the winter of 1939-1940, however, one portion of the collection was overwintered in an unheated house. Although freezing continued for several weeks in January and February with temperatures in the neighborhood of 15° F. no damage followed. It is possible that the low temperatures of the

entire winter, beginning in October and gradually declining had ripened all the wood most effectively.

As yet no plants have been overwintered out-of-doors as they are being used for propagation studies. It seems not unlikely therefore, that some of these plants may prove entirely hardy, since no clone of *Rhododendron indicum* (Azalea macrantha) is tender here with the exception of *R. indicum* Haka-tashiro a white form that is often but not always injured in cold winters. The late E. H. Wilson apparently considered this a white form of *R. indicum* but it seems not unlikely that it may be of hybrid origin. He also follows Millais by including the form *tanimanoyuki* in which the flowers are salmon red, whitish at the base. This particular clone is one we have never found listed, but it appears to resemble the flower pattern offered in these new azaleas in the clones Bunkwa, Hatsu-gasumi, Heiwa-no-tikari, Kaigetsu, Keisetsu, Shinnyo-no-tsuki, Zan-getsu, all of which have white flowers with wide colored borders of one hue or another. This intensification of color along the border is quite different from the tinted borders one sometimes finds in Kurume azaleas and much more definite than the color in the rhododendron Amphion.

The flowers fall roughly into groups—white ground, red stripes, 15 varieties, ditto but double flowers 1 variety; white ground lilac to purple stripes, 21 varieties; pinkish ground, red stripes, 4 varieties, ditto purple stripes, 2 varieties; white base, colored margins, 7 varieties; self colors 2 single, 1 double; purple with white variegation and edge. One variety, particularly recorded for its tiny variegated leaves, has not flowered as yet.

There is no clone listed here that is absolutely pure white. Occasional white flowers appear but nearly all are

flaked, dotted or striped with color.

There is a tending to variations in corolla form that takes two expressions, one the increase in the number of lobes up to 8 (normally 5) and to the production of a wavy margin. The latter is common enough among the florists' azaleas and presumably can be traced to those parents.

Variation in foliage is mentioned in several clones but shows in some others. From experience with other crosses made here variegations in foliage often follow the use of a variegated flower and become particularly apparent in the autumn when the color-

ation is most intense in the originally less green portions.

For those portions of the country where the hardier Indian azaleas (*R. Simsii*) are widely used this series may be of great value since they have a much later season of flowering. As grown here, cool but under glass, their flowering is always adequate, but sometimes scattered so that there may be the objection of irregular flowering that is often laid to old *macrantha*, (*R. indicum*). This irregularity of flowering is not serious in most clones and works its greatest disadvantage in florists' groups.

B. Y. M.

Rock Garden Notes

ROBERT C. MONCURE, *Editor*

Alaska Wild Flowers

To the plant explorer and botanist the diversity of climatic conditions in Alaska suggests adventure, for this means a diversity of plant life.

It is perhaps the alpine which arouse the greatest interest among present-day gardeners. Alaska offers hundreds of species, growing above the timberline of its numerous high mountains. Some of the dwarf alpine shrubs have been introduced into gardens, and more are gradually becoming available. Many of the small ericas, which Alaska produces so abundantly, may be raised from seed by the careful gardener, and even a few of them will bring an air of secrecy and wildness to the most prosaic rock garden.

The writings of John Muir are interspersed with rhapsodies over the cascades, which is also my favorite of the alpine shrubs. *Cassiope mertensiana*, with its little creamy pink-tinted cups, romps gaily over acres of mountain slopes in southeastern Alaska. Its

sister, *C. lycopodioides*, is found in the same section, but is more reserved and does not contend with coarser growth. Where the ground is bare and the soil stony and meager it often has for companion the tiny mountain azalea, *Loiseleuria procumbens*, well known to botanists but rather difficult to establish in gardens. *C. tetragona*, the cascade of interior Alaska, quite similar to *C. mertensiana*, is also very spectacular and lovely.

Darkly evergreen, the small plants appearing almost like flattened spruces, Alaska furnishes three known species of *Phyllodoce*. The most abundant and widespread is *P. glanduliflora*, the yellow heather. Its nodding, sulphur-yellow blossoms are borne profusely and are most attractive. More striking is *P. empetriformis*, the red heather. Its clustered flowers are shaded from old rose to red. *P. aleutica* is near to *P. glanduliflora* and is found on the mountains of the Aleutian Islands.

Kalmia microphylla, known as bog laurel, grows abundantly in southeast-



Ada White Sharples

Fritillaria camschatcensis (one-half natural size)

Arctostaphylos uva-ursi (about one-half size)

ern Alaska. It is already well introduced to gardens. Its showy rose-hued blossoms are clean-cut and symmetrical. Along with this grows *Ledum groenlandicum*, "labrador tea," with clusters of small white flowers. Its foliage has a spicy, aromatic smell which is very agreeable. *L. decumbens* of the interior is quite similar, but smaller, and is found growing on dry hillsides instead of in bogs.

The more tall-growing *Cladothamnus pyrolaeiflorus* is just as brave as the low-growers in climbing heights. It is usually sheltered by an upthrust ledge of rock. In the open, although it sometimes attains 10 feet, it is flattened to the ground by wind and heavy snow.

The shores of picturesque Skilak Lake on Kenai Peninsula is the home of still another group of small ericaceous shrubs. Here beneath the lovely white birches (*Betula alaskana*), on all sides and in every situation, is spread a carpet of *Vaccinium vitis-idaea*, the low-bush cranberry. In June the faint perfume of its small pink bells permeates the entire atmosphere. Later whole hillsides take on a reddish cast from the abundance of its ripened fruit. In winter the soft carpet of evergreen is bronzed. It creeps over logs, under trees and into open again, forming jagged rocks into rounded hummocks. Bears and squirrels feast on the berries. Even more beautiful is the well known *Arctostaphylos Uva-ursi*, "Kinnikinnick" or "Alaska holly." Its long, trailing branches, clothed in shining evergreen leaves, hang down over the bare rock cliffs. Its blossoms are small waxy pink urns, followed by red berries which persist all winter. At Christmas time we rejoice if there is not too much snow to find Kinnikinnick for our wreaths and garlands. Another of nature's evergreen groundcovers in this location is *Empetrum nigrum*. I have never determined whether its com-

mon name, "crowberry," is derived from the blackness of its abundant berries or from their attraction for crows.

At the foot of the cliffs, along the lake shore, often occupying small islands or higher ground surrounded by water, we have the very lovely *Andromeda polifolia*. Its leaves are needle-like and gray-green, its blossoms a beautiful uniform pink.

Both the red bearberry, *Arctous erythrocarpa*, and the black bearberry, *A. alpinus*, are found here, growing in open woods. They are also often found at high altitudes.

These same cliffs are the home of an array of herbaceous wild flowers. The first to appear is the very beautiful *Draba nivalis*, with yellow flowers above the gray-green mats of foliage. This, flowering with the rare magenta-petalled *Saxifraga oppositifolia*, is a sight long to be remembered. The appearance of either of these is always a surprise. It seems still too early and cold for flowers. At the same time the cliffs are dotted with a scattering of the small annual *Androsace septentrionalis* and *Potentilla nivea*, while others are on the way. Their flowering merge into that of *Polemonium pulcherrimum*, *Saxifraga bronchialis*, the very showy *Arnica Lessingii*, which I consider far superior to the well-known *Arnica montana* for rock gardens, *Heuchera glabra*, and others. However, the glory of the cliffs during July and August is the Bluebells, *Campanula heterodoxa*, which seems to delight in growing in crevices where no earth is visible. With this blossoms the little beauty, *Dianthus repens*, growing in the very hottest and most exposed situations.

Close to the water's edge along the lake shore, in this section of Alaska (where we have bright sunshine in summer and it is seldom more than 30 degrees below zero in winter), a veritable riot of flowering plants come and

go through the season. *Iris setosa*, the one Alaskan species, is the dominant note at one season. At another, large sections of the beach are given over to *Lupinus arcticus*, which is fragrant and has quite an extensive color range. Standing partly submerged are large drifts of *Allium sibiricum*, which is equally happy in dry ground. Its bright pinkish mauve heads are showy and good. Growing where its seeds, like small flakes of cotton, have been caught in tree roots or against a rock, are conspicuous colonies of *Anemone parviflora*. These dwarf white windflowers bloom in earliest spring and again in the fall. From the very early appearance of *Caltha asarifolia*, this situation produces beauty throughout the short season. Included are *Arnica Lesingii* and many of the other cliff-dwellers already mentioned, the taller but equally lovely *Arnica chamissonis*, the dwarf *Aster sibirica*, *Astragalus alpina*, *Aconitum delphinifolium*, *Solidago multiradiata*, *Galium boreale*, *Lathyrus maritima* and *L. palustris*, *Valeriana capitata*, *Senecio hyperborealis*, and quantities of the black lily, *Fritillaria camschatcensis*. One glad day I found

a large colony of *Cypripedium guttatum*, holding its own amid the others. Alaska is well supplied with orchids. Its bogs over the entire territory produce numerous species of *Limnorchis*, *Habernaria*, *Spiranthes* and others of this type. *Cypripedium passerinum* and *C. guttatum* are the two known cypripediums. The altogether beguiling *Calypto bulbosa* is found in various parts of the territory. It was once my good fortune to visit an island in southeastern Alaska, comprising about four acres, where these bits of enchantment simply covered the ground. The perfume, which is uniquely different from that of any other flower, could be discerned from a considerable distance. I have been told of other islands in that vicinity where it grew in the same way. In southeastern Alaska it seems to prefer, or even demand, an island home for some unknown reason. In the interior, farther North, where there are no islands, it has been reported growing on the mainland.

MRS. ADA W. SHARPLES

Cooper's Landing, Alaska.

Cacti and Other Succulents

Echinopsis.

If cacti did not flower at all, their unbelievably odd forms—their sheer audacity to live their lives in the shape they're in, would alone command the respectful admiration of gardeners, not to mention the devotion of cactus fanciers. And I believe the lowly cactus enjoys this widespread and diversified enthusiasm because of the varied and enigmatic qualities of its own natural appeal.

It is at once the hearty proletariat

and the splendid Oriental magistrate, an Eastern mystic and a soap-box democrat; with dignity it grows in great formal gardens and with sunless piety it grows in the tenement flower box. Scientifically they tell us cacti have no close relatives, the Lone Ranger of the plant kingdom. Even as far back as the Dinosaur Rex. And I am glad for that very overgrown serpent might have extinguished my pets, those forms of *Echinopsis*—Hedgehog. They are natives of South America, growing east

of the Andes down to Argentina. Twenty-eight species have been classified with great numbers of hybrids to be accounted for.

My start of one of these hybrids (don't ask me the name for all I know is *Echinopsis Eyriesii*). Variations came to me years ago by "looking longingly at a friend's plant." This plant (see photograph) is dark green with fifteen spineless ribs, is about two feet tall and six inches thick. It has borne hundreds of blossoms and children (branches), literally like the old woman in the shoe. At present there are eighteen children clinging to her skirt from bottom to waist high, the size of walnuts to goose eggs—if goose eggs were round. The flowers are trumpet-shaped and about eight inches long, soft pink and are very fragrant. It opens at intervals all summer and will remain in blossom two days if kept in cool shade. You may be sure it is the life of the party those summer evenings when guests in the garden whiff that aromatic oddity and see by Oklahoma moonlight its shell colored majesty.

The little plants or branches may be taken from the older plant when they are an inch or less in diameter (the young plants have short spines which later disappear). If planted in soil containing liberal amount of humus, they will bloom within two or three years. They grow very nicely in a protected corner of the garden under the shade of annuals—but don't forget to dig and pot them before the first frost. And when growing them in pots, give them shade from afternoon sun and water when dry. I am sure you will not be disappointed in *Echinopsis Eyriesii* in variation—or Barrel Cactus.

STELLA HAYDON

Norman, Okla.

FOUR SURVIVORS

Lemaireocereus Dumortieri (Salm-Dyck) Br. et R.

Curiously enough, this species which did not look as if it would be of much use in a beginner's window shelf has weathered all the days since and made what might appear as normal growth. In Borg's "Cacti" (page 125) it is reported to be "Native of Central Mexico in the torrid valleys along with *Cephalocereus senilis*. * * * A beautiful and free-growing species, requiring warmth and full sunshine." Its location at a southern window, rarely opened even in August, because of drafts, is one that is warm and gives as much sunshine as any window.

Up to the present time, the stem is still erect, rather glossy yellow green with 5 ribs, laced along with the stars of yellowish white radial spines and in ours, inconspicuous central spines. As yet, needless to say, it is too small for flowering.

Cephalocereus polylophus (DC.) Br. et R.

Here again is a surprise, except that it is reported (Borg, l.c., p. 102) that it grows "well in full sunshine and also in half shade, * *."

Unlike many of the related species which include the familiar "Old Man" cactus, this species has no special development of wool at the areoles. This is somewhat made up for by the very handsome yellow radial spines that line the numerous ribs contrasting well with the grass green surfaces of the body of the plant.

Growth has been very slow during the two years here and there has been a definite reduction in diameter over the original. Here again no flowering.



Echinopsis Eyiersii

[See page 62]

Notocactus Ottonis (Lk. et Otto) Berger

This appears to be a plant giving a great variety of forms if one may follow the varieties recorded in some texts. The specimen in our group was originally planted in a glazed blue pot in company with an equally small *Rebutia* and a larger *Echinocereus*. The *Rebutia* flowered beautifully, seeded and died; the *Echinocereus* lived comfortably for a time and then succumbed to ignorance, but *Notocactus Ottonis* has grown on with a steadily increasing diameter. This plant is almost globular, slightly flattened or indented at the top, with not very conspicuous ribs—quilted down with circles of radial spines, an up and down pair of central spines and little of the reported wool. Various small sprouts have appeared at the base but at some little distance from the actual perimeter of the plant. Not a sign of blooming yet, even if Mr. Borg says it flowers freely. Half-shade is recommended and this for us is approximated by setting the dish on the inside of the shelf from the window.

Notocactus scopia (Lk. et Otto) Berger

As growing here is a much smaller affair, much more cylindrical, with shorter bumps but much finer, much showier and bristling radial spines as well as straighter brown central spines. This is one of the species that has to be turned frequently or it begins to grow off axis. Like its kin, this shows no sign of flowering.

These notes are not offered with the idea that the cacti have fared well here or deserve special commendation, but rather that others may risk a pot or two on a sunny window sill and fare as well or better. Each gives its own reward in close observation, being full of pleasant details of organized pattern that

can stir many a pleasant train of thought.

Baffling Neobessyas

The article by Mrs. Magers, about what she says is *Neobessya missouriensis* reminds me of my efforts to make head or tail of that genus when I lived in north Texas. I had Britton & Rose's descriptions of *missouriensis*, *similis* and *Wissmannii*, and to save me I couldn't tell tother from which.

The neobessyas are plentiful in north Texas (not the Panhandle but the tier of counties lying south of Red River, and on down to Dallas, and I don't know just how much farther.) I had singles and clumps from all over that territory, and when they bloomed, which they did every spring, I sat over them with Britton & Rose's descriptions in my hands and compared every last detail mentioned with the plants under my eyes, but the only result was a headache and a bad temper which lasted for several days.

I remember rather distinctly that the illustration of *N. missouriensis* in Schultz & Runyon's "Texas Cacti" showed a single stem and the text said that it was sparingly caespitose. Nearly all of the genus I have seen, which are so many that I cannot even estimate their number, were high-crowned clumps of from a dozen to a hundred stems. (Maybe I ought to say "branches," for they branched from the mother stem at or below the ground level.) The flowers ranged in color from a pale, micaceous green to a greenish terracotta with a deeper pink stripe down the center of the narrow, pointed petal. Some had the central mass of anthers white, some pinkish and some a bright cerise. And these characteristics were not constant in conformity with any one type of stem

or growth, but "all mixed and mingled."

As to the scarlet berries: I don't know whether or not Mrs. Magers meant to imply that they ripen shortly after the flower withers, but as a matter of fact it takes the fruits 12 months to mature.

In winter the plants wither to a certain extent and "draw up," so that the tops of the stems are flat and at or very nearly at the level of the surrounding ground. In this condition they are hard to find. They turn gray and trash catches in the spines, so that they look pretty much like the surrounding short grass, which is where most of them are found. When growth starts in the spring they swell with sap and the

crown rises until the clumps are often almost as convex as half of a globe.

In some parts of their habitat the individual stems are up to three inches in diameter, but I have seen flat clumps of a hundred stems in which each was no broader than a 25c piece. These latter seem to occur more frequently between Paris to the east and Gainesville to the west, and southward, in the calcareous "gray land" which borders the famous Texas black prairies.

Neobessyas do not appear to relish the conditions under which more xerophytic cacti occur. I found none, or nearly none, west of a north-and-south line running through Fort Worth.

W. A. BRIDWELL

Dumas, Ark.

A Book or Two

The Garden Clinic. Written and illustrated by Laurence Blair. The Macmillan Company, New York, 1940. 146 pages. \$——.

This is a pleasant but probably not a very important book. The horticultural parts seem fairly sound and routine but the clearly stated pathological parts are rather cryptic for anyone who might need such elementary text as is offered in the horticultural parts. The diseases are named but not always described. In the very first heading, which is "Ageratums and Eupatoriums," we have next to nothing about ageratum and then via Perennial Ageratum (*Eupatorium coelestinum*) which is no ageratum at all we arrive at the eupatoriums. Then we meet crown rot and rhizoctonia, but on which is not stated. Maybe both. Aside from the

fact that plants with these diseases wilt, we have no data.

Again "Alyssum is subject to club root." How does one know: dig it up and see?

Some of the drawings are pretty funny and some are exquisite. Even old hands will sigh to see didiscus heads larger than foxglove spikes. The peonies have rather odd stamens; the iris species with flowers all one size are a wonder to see; all the lilies with four or five perianth segments; the strange tulip on page 87; the 5-petalled crocus on page 95; the strange magnolias (?) on page 113, and the unbelievable night-flowering water lily on p. 137, floating as they never do—and of a style they never had.

If indeed this book is meant for beginners it is too bad that it is not more accurate. The errors are all inexcusable.

Modern Roses II. Prepared for The American Rose Society by J. Horace McFarland. The Macmillan Company, New York, 1940. 256 pages, illustrated. \$5.00.

In 1930 Dr. McFarland published "Modern Roses," which was essentially an annotated check list, illustrated in black and white and in color. The present volume follows essentially the same plan. It, however, has "4,833" rose varieties and species of real value and interest, described with reasonable uniformity. These include not only "all those now in commerce, but others that ought to be, plus old roses that have real merit." It is, therefore, a much more pretentious volume, essentially of reference value.

Dr. Rehder, of the Arnold Arboretum, has done the species roses.

The illustrations are interesting chiefly for the black and white portraits of breeders that are figured on the reverse of the color plates of their originations.

Florida Trees. Ethel Snyder. Geddes Printing House, Fort Myers, Florida, 1940. 150 pages, illustrated. \$1.00.

The subtitle of this volume reads, "A practical handbook for the identification of Florida's Trees and Palms." This indicates a truly noble ambition and a most desirable goal if it were accomplished. The book as it stands is pretty bad. The paper is poor, so the engravings are poorly done. They are also encumbered by the stupid pictures of nearly naked models grinning foolishly as they stand in cypress swamps! Most of the pictures are of subjects that all would know anyway.

Typographical errors abound and they are not confined to technical terms.

The text leaves much to be desired. It is certainly not practical to identify

anything from the text unless one would be competent to use a technical book. There are some astonishing misstatements, as that the silver maple (*Acer saccharinum* L.) furnishes "the maple syrup of commerce." There are amusing comparisons, e.g., *Albizia lebbek* which is not specially distinguished in flower is noted as having flowers of "a greenish yellow," while *A. julibrissin*, which is showy, has no color mentioned. Our old friend, *Cerantonia siliqua*, appears as "carbo," not carob! *Ficus benjamina* becomes *Ficus benjamina*. The tung oil tribe appears in various disguises as *Aleurits* and in the index as *Alewits*. Bamboos are discussed in one paragraph with no suggestion of their many kinds, habits, names, etc. Scarcely one page escapes its share of "boners."

Most of this could be dealt with temperately if the handbook were really that and if one could possibly use it for plant identification.

A Plant Handbook. Compiled and published by The Connecticut Arboretum at Connecticut College, New London, Conn., as Bulletin No. 3, June 1, 1940. 60c postpaid.

This is a very useful small book for certain types of people. It is frankly a compilation according to the signers of the foreword statement, Harriet B. Creighton and Priscilla Pasco. It is loose leaf, spiral back with pages of all sizes, so you may choose your section and consult only that. The first list is of Street Trees and offers 24 sorts with their Latin and English names.

Screens and Windbreaks, Hedge Plants, Ground Covers, Native Trees and Shrubs, New England and so on.

All compilations are likely to be dull even if serviceable but this one has a nice sense of humor for among the "Plants for Attractive Fruits" under Miscellaneous one finds the Ginkgo with a "green" fruit. The fruit is indeed beautiful to see but we would love to send the ladies a bushel and see how much farther they would care to go.

Most of the shrubs are too large for most rock gardens. *Abies concolor* does not do well in cities this far south, but maybe it's all for New England?

Rocky Mountain Trees. Richard J. Preston, Jr. The Iowa State College Press, Ames, Iowa, 1940. 285 pages, illustrated, appendices.

This is a book addressed apparently to the amateur, rather than the professional botanist. There is a careful introduction followed by check lists of the trees of each state, followed in turn by keys to the genera.

The manual itself gives species keys for the genera followed by two pages for each species, one an illustration, distribution map, the other the description. In some cases the species have been put two to the sheet. Within such narrow limits of space, descriptions must be brief and these are in paragraph form with similar headings in each case. Many of the illustrations are borrowed and some are better than others. The maps showing distribution are very small scale and indicative only in a general fashion. From them one is lead to question the extent of the Rocky Mountains. It remains, nevertheless, a useful book.

Alphabetical Iris Check List. Edited and compiled by Ethel Anson S. Peckham, Baltimore, 1940. 582 pages. \$4.00.

Just what the title tells and no more! It is a most useful historical volume but will not serve as a basis for identification of iris with lost labels. Supercedes former edition.

The Plant Doctor. Cynthia Westcott. Frederick A. Stokes Co., New York, 1940. 297 pages, illustrated. \$2.00.

This was an excellent book in its original edition. It is even better in this which shows the fruits and increased judgment of the four years that have followed the issuance of the first edition. It has practically everything that Mr. Blair's book, reviewed earlier in this column, lacks. It is commended to all gardeners, and to non-gardeners it must be pointed out that while it deals entirely with troubles in the garden it is no nightmare of gloom and no deterrent to new gardening operations. The author appears to have the singular gift of being aware of research without having become its slave!

Better Lawns. Howard B. Sprague. Whittlesey House, McGraw-Hill Book Company, New York, 1940. 205 pages, illustrated. \$2.00.

This is an excellent book from every point of view. Nearly every gardener known to this reviewer has struggled some time or other, if not continuously with a lawn. He has listened to endless proposals and may have followed them all. Here is a new program. The author shows by a clear map, exactly what part of the United States he is dealing with.

He then patiently considers all phases of life that relate to lawns. It is so good, it is almost in the cookbook class, to be used on the scene of operations until memorized.

The Gardener's Pocketbook

TWO PACIFIC COAST SHRUBS

Ceanothus papillosus var. *Roweanus*.

Flowering shrubs with deep blue blossoms are always sought after. Among the so-called wild lilacs, or blue-blossoms (ceanothus) native to California some of the best are to be found. Of all the deep blues of this rich genus that of *C. papillosus* var. *Roweanus* is the most vivid.

The species *Ceanothus papillosus* is a native of the wooded coastal slopes of the Santa Cruz mountains and the Coast Ranges of central California. In its native habitat it is rather scraggly. It may grow as tall as 14 or 15 feet, with blossoms varying from pale to deep sky blue. While the species is desirable, its merit for landscape use does not compare favorably with its variety *Roweanus*.

C. papillosus var. *Roweanus* is a low spreading shrub 2 or 3 feet high. It makes an excellent rock garden shrub for California, and should be tried out in other mild climates because of its great desirability. The narrow evergreen leaves are linear, rolled in at the margins and somewhat sticky. They are from 1 to 2 inches long, $\frac{1}{8}$ inch to $\frac{1}{2}$ inch wide, shiny above and arranged thickly on the hairy young stems.

The real glory of this shrub is its deep blue flowers. Seen at the height of bloom with a carpet of cream cups and nemophila underneath it is an unforgettable sight. Since the species grows among trees in the open areas it will take some shade, but requires light soil with plenty of humus. In California it flowers in March or April, depending upon the rainfall.

Ceanothus papillosus var. *Roweanus* is found growing wild in only a small

area, on a rocky and inaccessible summit on the south side of Mt. Tranquillon, near Lompoc. Very few plants are left, due to the grazing of animals and the encroachment of vigorous stands of manzanita, greasewood and *Ceanothus ramulosus*. It has been named for Mr. E. D. Rowe, of the native plant gardens at La Purissima Mission near Lompoc. Established there by him in masses with *Ceanothus thyrsiflorus griseus* and others in the foreground of the mission it makes a vivid display of color.

At Santa Barbara Botanic Garden in Mission Cañon this variety is effectively grouped with *C. impressus* and *C. dentatus*, in front of tall masses of *C. spinosus* and yellow flowered fremontia. The grower kindly gave me several plants which are thriving in my collection at Laguna. They are planted on a bank, with liberal amounts of fine gravel and leaf mold added to the soil to lighten it. As with other members of the genus, sharp drainage is of paramount importance.

In the garden of Lockwood de Forest at Santa Barbara *Ceanothus papillosus Roweanus* is placed on a bank in front of pink flowering trees, cherries I believe. Grouped with *C. dentatus* it sweeps down over the rocks to level ground, where a mass of blue babiana in bloom gives the impression of a reflecting pool.

Like *C. purpureus*, *C. papillosus Roweanus* is a recent introduction of great value and interest to our south-land gardens.

LUCIA F. EDWARDS
Long Beach, Calif.

Ceanothus purpureus.

Among the California native ceano-



Lucia F. Edwards

[See page 68]

Ceanothus papillosus var. *Roweanus* (upper)

Ceanothus purpureus (lower)

thi with beautiful evergreen foliage, perhaps the most outstanding one is *purpureus*, the hollyleaf ceanothus.

Native of the southern part of Napa county, *C. purpureus* grows among the chaparral on dry hot stony slopes. It is of recent introduction to our gardens, but I have observed it growing lustily in five widely separated localities throughout the length of the state in the coastal belt, and it seems adaptable. Unlike many other natives it is well to keep it the first year in a gallon can or pot, setting it out when it is a year old.

This shrub is usually somewhat erect, about four feet high, though it is sometimes low and spreading. The glossy foliage is hollylike, thickly clothing the stems. The leaves are about one-half inch long and equally broad. In addition to the exceptionally fine foliage, *C. purpureus* produces in spring a profusion of deep rich blue-purple flowers in umbels an inch wide, clustered thickly along the ends of the somewhat stiff reddish branchlets. The round fat buds with their reddish purple scales add further color. The flowering period varies somewhat with the season. It flowered in Southern California in early April in 1939, a month earlier in 1940.

Like most California species of ceanothus, *purpureus* is difficult to establish, resentful of over-coddling, too much or too little water. After the first summer, however, *purpureus* appears perfectly at home, and if given light summer watering and protection from the hot afternoon sun should thrive. In my own garden it is doing well in light soil with added leaf mold.

To those who search for choice evergreen shrubs for rock garden or slope, and who garden in mild climates, *C. purpureus* will prove a real treasure. In well drained soil with plenty of moisture it should do well. A good speci-

men will not fail to lend interest and real beauty to the garden.

LUCIA F. EDWARDS

Long Beach, Calif.

THREE SOUTH AFRICANS

Gladiolus gracilis Jacq. [See page 71]

Little Blue Papie. Blue Afrikander.

To most people, the word gladiolus inevitably suggests the tall spikes of flowers in many colors which are found in almost every garden and florist's shop. These have their worshippers, many in number, and are called by the rather inept name "Glads." Beautiful in color as they are, often lovely in the shape of the flowers, they lack something, some subtle essence, some ethereal quality, which the wild progenitors of the group possess.

It is a large group, this wild one, with between 200 and 300 species, mostly South African in origin. One of the daintiest and most charming of these is the Blue Afrikander, *Gladiolus gracilis*. It is one of the earliest to bloom in the springtime of its native land. Two or three (rarely up to six) delicate flowers of pale blue on their thin, grass-like stems sway in every breeze. It is found on the mountain slopes of the Cape Province—on Table Mountain and its guardian, Devil's Peak, and in other parts of the province, from almost sea-level to 3,000 feet.

Never found in masses, enough may be gathered over a fairly narrow space to make a good handful of the flowers. They hide among the rocks or near one of the low veld bushes, giving one a small thrill on their discovery. Not so fragrant as the Mauve Afrikander, *Gladiolus recurvus*, with its flowers which are mauve, pink, blue or yellow, with a golden blotch on the lower petals, it has a slight elusive perfume, though some authorities deny this,



Courtesy South African Rivers and Harbours

[See page 70]

Gladiolus gracilis (upper)

Gnidia pinifolia

being perhaps less sensitive to fragrance than others. The two species are sometimes hard to distinguish. *Gladiolus gracilis* is, however, several shades lighter in color and lacks the spotted spathe of *Gladiolus recurvus*.

The South African botanist, Mrs. H. M. L. Bolus, writes of the Blue Afrikaner quite appealingly in the "Journal of the Botanical Society of South Africa" (part xiv-1928) as "this graceful creature with its wire-like stem and quiet charm of gray-blue flowers, few and loosely spaced."

Redouté pictures it in his magnificent work, "Les Liliacées," (Vol. viii). He calls it the Slender Gladiolus or Corn-flag (*Glayoul effilé*) and says that it bloomed at Malmaison in February, 1809. It was introduced probably, he says, by the Director of the gardens at Schönbrunn.

In Jacquin's "Icones Plantarum rariorum," (Vol. ii, 1786-1793, Plate 246), the flowers are shown in white and in pale blue, with dark broken lines on two of the lower segments and a single dark line on the middle segment. In the "Botanical Magazine," Vol. xv-xvi, 1802, Plate 246), the flowers are pale blue with a blotch of white on the lower side segments, but not on the middle one and with the dark broken lines on the side segments only.

The corm of this species is very small in proportion to the height of the stem, round, with strongly matted tunics. The stem is slender, grass-like, 16-24 inches in height, straight below, bent above. The spathe-valves are lance-shaped, obtuse, green, one foot long. The "Botanical Magazine" says of the leaves that "they have the appearance of being thick and flat with a deep square groove on both sides, owing to the midrib being nearly obsolete and the marginal one projecting far forward, 3-4, far-sheathing and short beyond." The spike is lax, one-

sided, 3-6-flowered, the flowers 1½ inch long, often nodding. The flower-tube is curved, broadly funnel-shaped above, the upper segment broadly oblong, pointed, the lateral segments and the outer lower segments rather narrower and longer, the central lower segment much longer and sharper, slightly reflexed and clawed. The style and the stamens are much shorter than the upper segments, the anthers small, violet.

Lt.-Col. Grey, in "Hardy Bulbs" (1938) says that "It is probably true that every South African species (of gladiolus) requires moisture during growth." Of this one he says, "This very graceful plant flowers in April and May in English gardens and should be grown in a sheltered position in light sandy loam." It is not one of the tenderest species.

J. W. Mathews, formerly Curator of the National Botanic Gardens (Kirstenbosch) and an expert in the growing of South African flowers, in an article in the "Journal of the Botanical Society of South Africa," (Vol. xiv, 1928), puts this species in the class needing "Hillside loamy soil." The soil recommended by him calls for 2 parts loam and 1 each of leaf-mold and sand. Water must be supplied to maintain even moisture throughout growth and the plant allowed to rest where grown or stored dry and warm. Bone and superphosphate may be used but any other fertilizer he would be chary of using. Of many South African plants this is true. The native soil is as a rule light and sandy and while fertilizers may be used, they should be used only with great care.

SARAH V. COOMBS

Scarsdale, N. Y.

Gnidia pinifolia Linn. [See page 71]

An attractive plant of the genus *Gnidia* (named for *Gnidus*, a place in

Crete). The genus includes nearly 150 species, chiefly African, a few in Madagascar and one in India. 87 species occur in South Africa, generally distributed. Gnidias belong to the Thymelaceae.

Gnidia pinifolia looks not unlike that old favorite of the florists' shops, bouvardia. It is a heath-like shrub with many-flowered heads and white blossoms which are intensely fragrant at night. The "Botanical Magazine," (Vol. xlv, 1818, t. 2016) says, "Its flowers though not showy are very fragrant, especially in the evenings. Requires the protection of a greenhouse in winter; flowers most of the summer."

The "Botanical Cabinet" (Loddiges, Vol. i, t. 7, 1818), "A native of the Cape said to have been cultivated by Miller 50 years ago; but it has long been lost to our gardens, till introduced anew a few years since" . . . (It) "is a very neat and pleasing plant, seldom grows above one or two feet high and flowers most abundantly, often twice in the year, spring and autumn. The blossoms are extremely fragrant in the evening. It thrives in sandy peat and in general requires the same management as the Erica, to which it is very nearly allied."

Andrews, in the "Botanical Repository" (Vol. i, t. 52, 1799): "It is a hardy greenhouse plant but is propagated with difficulty by cuttings; growing to the height of eighteen inches, being most exquisitely scented by night, continuing in flower at least three months, and thriving best in a light peat soil."

It is (or was) frequent on the Cape Flats and hills near Cape Town. In "Wild Flowers of the Cape" (Hammer-Driscoll-Levyns), it is said that it grows on the top of the "Saddle" (between Table Mountain and Devil's Peak) with pink heath, well-grown pro-

teas and effects in old ivory caused by the bracts of leucadendron.

There has been some confusion about the specific name of this plant and it has been called (beside *pinifolia*), *radiata*, *imberbis*, *Sparmanni* and *simplex*, but in the Kew Index, the name *G. pinifolia* Linn. is given.

This small shrub has forked or fastigiata, rather slender branches, alternate leaves, narrow and pointed. The calyx is densely hairy outside, with four spreading lobes. The tube is 6 lines long, the lower quarter inflated and triangular, the upper part cylindrical. Petals 4, 1 line long, anther-like, fleshy, densely hairy all over. The true anthers are oblong, concealed within the tube of the flower. Marloth in "Flora of South Africa" (Vol. ii, page 215, 1925) says that the genus is readily recognized by its 4 petaloid sepals, the 4 simple or completely divided petals and the 8 sessile stamens arranged in two rows. He describes also *Gnidia oppositifolia* Linn., called Kannabas, a shrub 3-5 feet high, growing in damp situations, very showy on account of its bright yellow flowers. *Gnidia penicillata* Licht., shown in Marloth's illustration, is a beautiful gentian-blue.

SARAH V. COOMBS

Scarsdale, N. Y.

Saintpaulia.

The saintpaulia, or more commonly called African violet, may well be named the most beautiful and satisfactory of house plants, yielding continuous bloom for ten months of the year.

The old form *Ionantha* is still good, but the blossoms are small and rather pale in comparison to the later introductions.

Among the newer strains the most outstanding are Norseman, Neptune and Commodore. Norseman has large sized flowers of a lovely deep blue tone, the yellow stamens adding to the rich-

ness of this color. Neptune is very much like Norseman in habit of growth, has the same dark glossy green leaves, but Neptune is a dark rich reddish purple like the rich shade in some of our finer fall bearded iris. Commodore is a still darker color with a velvety texture. Blue Boy has a good flower but the foliage and character of growth is not so pleasing as the newer varieties.

The amateur will find the saintpaulia very amenable to ordinary culture, provided they can be given a sunny window. My plants have sun until three o'clock in the afternoon, from then on the slanting rays still reach them. A fairly even temperature suits them best.

A friable soil made of equal parts of good loam, granular humus or leaf mold, sand and some very old manure is the ideal planting medium. March is a good time to propagate them, when leaves with strong stems may be cut off and inserted in sand with the addition of some peat moss. The sand must not be kept too wet during the process of rooting which will be from four to six weeks. After the stems are well rooted plant in small pots, and grow on, and when the little pot is filled with roots shift to a larger pot. When the large plants form divisions one may take these off and plant, and these will quickly make fine sturdy blooming plants. It takes about seven months from leaf cuttings to produce a fine blooming specimen.

Watering properly is one of the secrets of success. When the soil on the top feels dry to the touch, it is time for watering, and most enthusiasts claim that no water should be allowed on the crown of the plant. However, greenhouse growers must water from over head thus this theory may not hold, but the proof of it is that the best successes come from watering from below or with a long spout just below the leaves. Never allow the pots to stand

in water after they have absorbed the necessary amount.

The latest theory is that water should be luke warm certainly not below 60 degrees, and generally this may be recommended for all window plants.

MRS. SILAS B. WATERS
Cincinnati, Ohio.

Cercestis sagittatus Engl. [See page 75]

Among the many strange plants that florists put together in the so-called "dish gardens" foisted upon the public in autumn is this curious aroid from tropical West Africa. In the supply catalogues it appears as *Nephtytis liberica*. How far a cry it is from its native land to the slat sheds in Florida, where it is grown by hundreds, possibly thousands, to the ignominy of a five and ten, or the flat bogs of a pottery dish or even a pottery animal!

If one looks it up in a sober book like Hutchison and Dalziell's "Flora of West Tropical Africa" one finds nothing but the technical notes that separate one species from its two fellows, the citations of literature and a record of the herbarium specimens the authors have seen! But there is a picture which shows clearly enough that our plant is not *Nephtytis Afzelli* or its synonym *N. liberica* as everyone would have you believe, but *Cercestis sagittatus*. The picture of the former shows a plant with a decent rhizome, prone as it should be, while our plant is making a stem. One goes back to the key since plainly our plant cannot be a *Nephtytis*, must indeed be either a *Culcasia* or a *Cercestis*. One looks desperately through the former and there is none with hastate leaves, so one goes over to *Cercestis*, where one is greeted by *C. Afzelli*, but this will not do and one goes on, arriving finally at *C. sagittatus* Engl. and reads with alarm that in its native Liberia it climbs to 90 feet. No matter, as we shall



Claude Hope

Cercestis sagittatus in center
The dish is eight inches across.

[See page 74]

never know, since it could not make ninety feet here even if it went around the room ten times.

To be sure that no egregious error has been committed for lack of flowers

and fruits, one looks back to botanical texts to see if in the aroids of the world, there is some other plant, possibly not even from Africa that might suit our plant more completely, but there is

none. The Index Londonensis yields no record of any picture of the species and the local herbaria are quite empty—so that even on the chance that another error is in the making, we go on to call our plant *Cercestis sagittatus!*

As a pot plant it has certain definite advantages, namely that it cannot be overwatered and apparently is indifferent to lack of drainage. It is sensitive to drying out and is very responsive to light. As our plant grows its leaves tend to turn toward the window and the light, so the dish must be turned from time to time to insure a pleasant carriage of the leaf blades. Just how we shall meet the problem of the possible climbing shoot remains to be seen; whether or not our plant will flower and produce its later red-fleshed fruits; whether or not new shoots will arise from the base we can only hope. Meantime it can be recommended for the sunny or half-sunny window and particularly to the owner who over waters.

B. Y. M.

Kigelia pinnata DC. [See page 77]

Even when Doctor Bailey knew of the edition of 1935 of his famous cyclo-pedia, there was no chance, doubtless, to alter the line on page 1738, in reference to the sausage-tree which reads: "This tree is practically unknown in the U. S." Now that his treks take him to Coconut Grove at least once a year, he must know that this tree is to the tourist there, what the cherries are to Washington in April, even if that specimen is by no means unique in Florida.

There is not so very much that can be said of and for the tree save that it is a strange affair as compared with our familiar trees as can be guessed from the illustration. For the visitor in Florida it gives a remarkable example of a curious fruit that does sug-

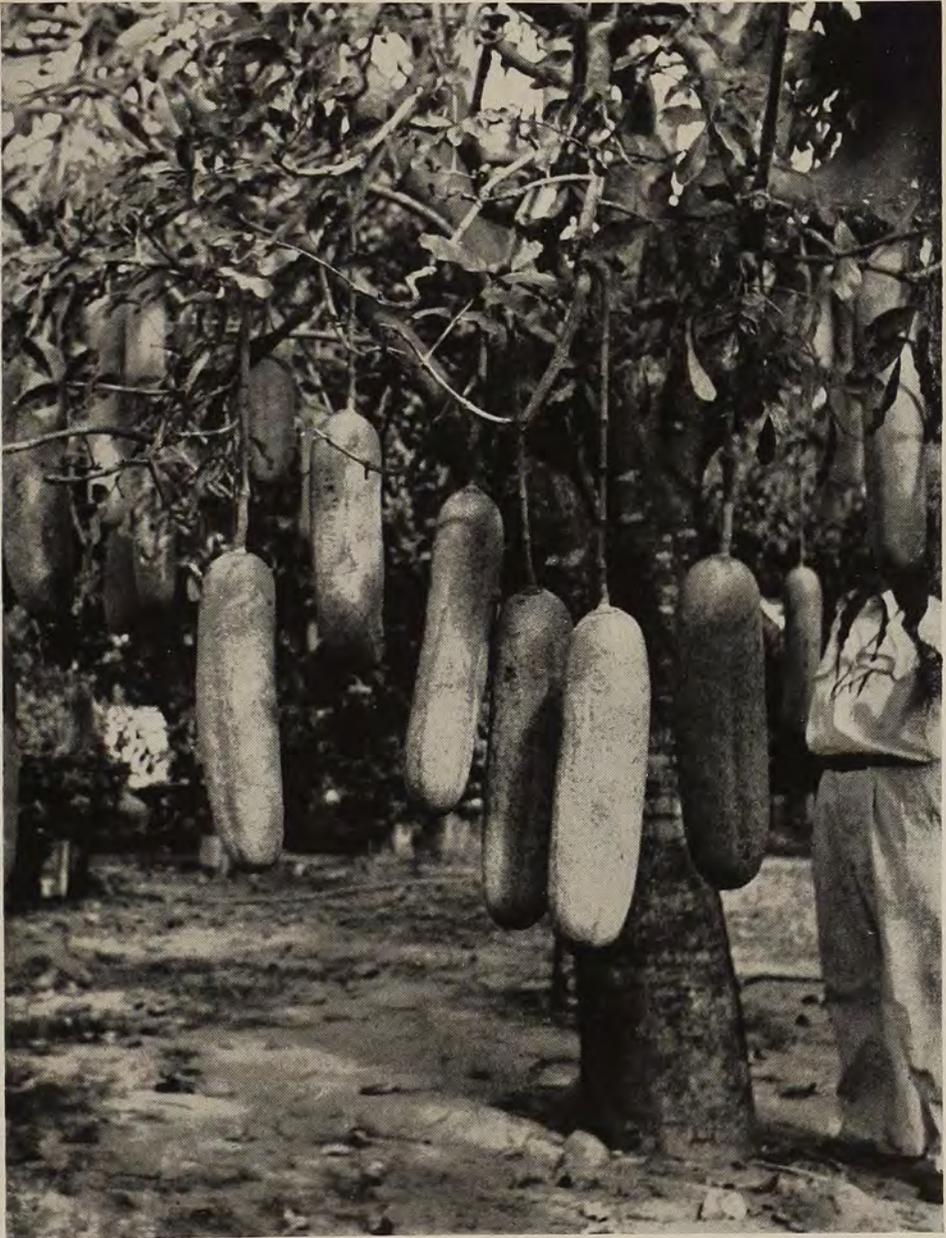
gest an old sausage, and for those who do not know the wonders of plant forms, something to marvel over.

It belongs to the Bignoniaceae, the great group to which our trumpet vine belongs. Other introduced plants in Florida that belong to the same order are *Spathodea* (see N.H.M., Jan. 1940; p. 59-60), *Tecoma*, *Tecomaria* and the like. None of these has fruits like *Kigelia*.

In Sim's "Forest Flora of Portuguese East Africa" (page 120) there is a note that might touch the tourist trade in time. "A white or yellowish softwood, equal in texture, taking a fair surface, and showing well under varnish. A timber of unusual strength and toughness, 35-40 pounds weight, and of considerable size, hence useful for many purposes, such as yokes, oars, wagon wood, etc., as also for planking, boxes, etc. In Magenja da Costa it is selected for spoons and other utensils. * * * * *" Perhaps some day we shall have salad bowls and the like turned from its wood.

For the fruits no reference has been found that can or will suggest any sort of use. "It is said that they have a habit of falling from the tree without warning, making it unpleasant for those who may be under the tree at the time, as the fruits are rather heavy." One hopes that this quotation from John Medley Wood's "Natal Plants" (Vol. IV, text with plates 386, 387) is accurate and not an understatement.

In the various bits written mostly by botanists and travellers, little is said about the flowers, but Wood supplies the notes that they are 4 to 5 inches across, dull dark crimson above and reddish between the ribs beneath. He says they "are very handsome but rather unpleasantly scented." In shape they suggest our familiar northern trumpet vine but with shorter tube and wider, more spreading lobes.



Harold F. Loomis

[See page 76]

Kigelia pinnata

The original description in DeCandolle's *Prodromus*, Vol. 9, p. 247 (1845) adds very little and certainly nothing to suggest the many details of

introduction that enliven some botanical works. Apparently DeCandolle established the genus for this species and reduced to synonyms Jacquin's *Crescentia*

pinnata and Sprenger's *Tripinnaria africana*. Although none other appears in DeCandolle (l.c.), there are apparently other species of *Kigelia*, all tropical and all doubtless as useless.

B. Y. M.

More Notes on Flowering Crabapples

Since Dr. Wyman says that *Malus floribunda* has red fruits, and the fruits on my tree are yellow with a red blush, probably mine is not true to name. However, it answers the description in all other particulars. The fruit turns brownish, and, like that of the Bob White variety that he mentions, hangs on the tree all winter. Why it should be left alone by the birds when *M. Sargentii* and a small-fruited hybrid are usually stripped clean before winter. I cannot tell. One is as sour and puckery as another to my taste. The fruits on the *floribunda* (?) are usually taken by pine grosbeaks in early spring.

The diversity found among seedlings is well illustrated by my experience with seeds of *M. Arnoldiana*. I gave away several of the young trees, but have two left. One is a round and shapely small tree, about eighteen feet high and broad, covered every spring with a cloud of small white flowers, which are followed by currant-sized fruits, rather pale yellow and blush, which, as I just stated, are eaten by birds and squirrels almost as soon as they are developed. The other tree, in a poorer location, is not so large, and exhibits the irregular habit of growth that we find in ordinary wild apple trees. The white flowers are much larger, and the fruits, nearly or quite as large as that of commercial varieties, and deep yellow and red, are extremely handsome. When in full fruit, the tree is gorgeous, but it has a tendency to take a rest every other year.

The same fruiting habit is the only drawback to *M. purpurea*. The pur-

ple coloring permeates every part of this tree. There is a hint of it in the bark in winter, and it is very noticeable in the young twigs and leaves, and in the three-quarter inch fruits. The inch-and-a-half wide flowers are a very deep pink, and when the arching branches are thickly wreathed with blossoms, about the middle of May, the tree is an arresting sight. Few flowering crabapples are grown in this vicinity, and this one, from its deep and unusual coloring, causes considerable speculation, especially when seen from a distance. One person was overheard, asserting positively that it was a pink forsythia!

Not long ago, in one of the garden magazines, someone asked if the fruit of flowering crabapples was poisonous! We have not tried to use any of the smaller fruits, but those of *purpurea* make excellent tart sauce and jelly. They will answer in place of cranberries in mock-cherry pie. As they drop after a few frosts, it is as well to pick and use them. We usually clip the stems with shears, to avoid breaking the fruit spurs.

RACHEL CAUGHEY

Antrim, N. H.

Neviusia again.

In 1927 Robert Ridgway (ornithologist) gave me some 3 foot root shoots of this species which I planted here in our arboretum. Soil neutral black loam (alluvial, bordering the Wabash River). I have just measured our clump and it is 13 x 14 feet and 8 feet high, a dense clump. It has never had a pruning shears on it and each year I give shoots from it and see to it that they are dug from the perimeter which helps to keep the clump in a round clump. Now I just can not recommend this plant too highly for soil such as we have. It has grown in the open in a way but has been sheltered on one

side by a tall English Oak and on the other by a sweetgum. Now I wish to mention one fact which is important and that is its hardiness. I keep phenological records and other climatic records. I do not wish to tire you with data, but I do this in behalf of my friend *Neviusia*. I have never seen the foliage of this plant injured in the *very least degree* by early frosts. Winter of 1935-36, not injured in the least and we had a minimum of 21° F. below zero. The following killed to the ground: *Arundinaria* 5 spp.; *Castanea mollissima*, *Cercis chinensis*, *Genista tinctoria*; *Koelreuteria paniculata*; *Quercus nigra* (4 ft. plant killed to ground); *Stephenandra incisa*, *Styrax japonica* to ground and others.

May 12, 1938, a low temperature of 28° F. and on May 13 a low of 29° F. On June 10 I made a note on inquiry as follows (abbreviated). Not damaged *neviusia*, birches, elms, maples, cypress, ginkgo, *rhamnus*, sweetgum, *viburnums*, wahoos, pines, larches. *Cladrastis lutea* 90% foliage killed; *Carya myristicaeformis* terminals all killed, recovering by laterals; *Cercis canadensis*, foliage nipped but recovered, but all foliage on *Cercis chinensis* killed, recovering by laterals; *Castanea mollissima* 85% foliage killed, recovered by laterals; *Celtis georgiana*, 95% foliage killed but recovered by laterals; *Magnolia acuminata*, 90% foliage killed but recovered, but the terminals recovered. The only species to do so, *Phellodendron chinensis* and *Laveleri* killed 50%, recovered by laterals; *Sapindus Drummondii* all foliage killed, recovered by laterals; *Asimina triloba* all foliage killed but recovered by laterals. I have selected a few that I thought might interest you.

Here is another memo that might interest you. On November 12, 1936, I took a census of the plants that still had their leaves. Before this date there

were two hard freezes, one night down to 21°. I mention only a few but I have only 36 listed out of a possibility of about 500 species, *Berberis* (5 species); *Chionanthus*; *Colutea* (2 sp.); *Euonymus* (4 sp.); *Kerria japonica*, *Leitneria*, *Ligustrum* (4 sp.); *Magnolia virginiana*, *NEVIUSIA*, *Quercus Sargentii*, *Rhamnus* (3 sp.); *Symphoricarpos orbiculatus*, *Viburnum* (3 sp.).

I hope the preceding desultory remarks will give my friend *Neviusia* better standing. Oh, yes, the first flowers appear here about May 10, and it is in flower for 2-3 weeks.

Bluffton, Ind.

Flowering Apricots (*Prunus mume*)

While the flowering reaches are rather widely known the gardening public seems to have very slight acquaintance with the very beautiful group of flowering apricots. It is quite possible that if it were realized that these are the classical "Plum Blossom of Japan" more attention would be paid to them. In spite of the latter term they are really apricots, not plums, which becomes entirely evident upon examining the fruit. This is used by the Japanese for pickling, primarily as a condiment, but is also considered a remedy for or preventive of cholera. The acidity of these pickled fruits is something that has to be tasted to be realized. Possibly the idea is that they will wrinkle the lining of the stomach sufficiently to kill even a pretty tough germ!

Flowering apricots differ from the flowering peaches chiefly in two respects. They bloom much earlier and the flowers are richly fragrant, the spicy odor suggesting that of carnation. The earliest forms often show flowers before Christmas in California in exceptionally early seasons, but even in late years will start blooming before mid-January. Of course the flowers

come and go long before the leaves appear. The natural forms have small single white flowers occasionally more or less pinkish. The bark on young wood is green, sometimes smooth, sometimes "thorny" due to short, sharp-pointed spurs.

Cultivation and selection has produced double flowering forms in various shades of pink, rose, and red as well as white. In this country only a few are known under definite names although many named sorts are offered by Japanese nurseries. However, as not even grafting wood can be imported none of these are available. Of the varieties generally grown in this country the finest double pink by common consent is the one known here as Dawn. This originally came from Japan and is said to be known there as Musashinono. It blooms about midseason. The young shoots are brown, not green. The richly fragrant flowers are very large with shell pink, ruffled petals, and borne in great profusion. As a matter of fact this variety ranks high among the most beautiful trees that can be grown in temperate climates. An earlier, somewhat similar variety is known only as "Early Double Pink." "Double Red" is a light red, while "Bonita" is the only double variety in this country bearing deep red flowers and is of moderate growth. This probably came from Japan, although it was named here.

Being unable to find a good double white the writer decided in 1932 to attempt to breed one. Several were obtained. The best was named, "Rosemary Clarke," for his daughter, and was introduced in 1938. Flowers are large, double, snow-white with red calyx; they have an intensely pungent, spicy fragrance. Incidentally, another with smaller double rose flowers named "Peggy Clarke" will be introduced this season. It is the only one of that color.

In addition to the varieties of erect growth there are weeping forms, but hitherto the flowers of these were all single or nearly so. In the course of the breeding experiment mentioned above two fully double pink weepers appeared. These bear at present only the provisional names, Weeping Double Pink No. 201 and Weeping Double Pink No. 204. Both are as fully double as the erect varieties but No. 201 is a week or ten days earlier than No. 204.

Rehder's Handbook (1934 Ed.) says the Japanese flowering apricots are hardy to Zone VI. We believe they are probably hardy and safe up to Lake Erie in all except the severest winters, but in sections subject to mild weather followed by late spring frosts there would be a certain probability of the flower buds opening prematurely and then being injured. However, in Japan it is considered one of the chief charms of this group that quite commonly the striking combination occurs of snow on the ground and flowers on the trees, so probably only experiment will decide the matter.

The trees never become very large and can be allowed to grow naturally without much pruning if the effect of the tree in bloom is the main consideration, but if sprays for cutting are desired they should always be taken from the two year wood, leaving the slender wands of current season's growth to develop laterals the second year when they in turn may be cut.

WALTER B. CLARKE

San Jose, California.

Monardella lanceolata.

A fragrant leaved hardy perennial is *Monardella lanceolata*. The plant has been perennial with me, although L. H. Bailey lists it as annual. It begins to flower in the latter half of August and the deeply colored flowers of roseate-

magenta on plants 14-16 inches high are welcome, coming when the hysops and beebalms are gone in the herb garden and only the late saturejas are still flowering. The monardella is pretty as a foreground plant with pink, rose or blue altheas. It is a splash of color and desirable because of its fragrant leaves, but is not truly handsome in itself.

The plant is bushy with stiff square stems covered with glands as are the cedar-green leaves. These are ovate lanceolate, much broader below the center, with apex pointed and the base narrowed to a short stalk. The leaves are smooth, occasionally notched on the margins and are folded on either side of the center and face towards the stems, showing their backs to the observer. They are about $\frac{5}{8}$ inch long and $\frac{5}{16}$ inch across.

The flowers are in spikes from 4-5 inches long, in opposite clusters of 4-7

and each cluster is subtended by a green leaf-like bract. They open slowly and the first will be in bloom when the next is still in tight bud. They are tubular and labiate but are unusual because the tubular calyx with five-pointed sepal lobes is the same color as the base of the corolla. The calyx and base of the corolla tube are Indian Lake and the flower is rosier, actually a rose-magenta or rose tinged with blue. The corolla, unfortunately, is somewhat untidy looking and not clearly patterned. The calyx is $\frac{3}{8}$ inch high and the corolla $\frac{5}{8}$ inch long beyond the calyx and is $\frac{1}{4}$ inch across at the mouth. The lower lip is three-parted with the center part turning up and touching the outer two. The upper lip is two parted and stands up straight. The thin two-parted pistil and two bronze-tipped stamens project slightly beyond the corolla. Two shorter stamens are down in the corolla.

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