ADDISONIA

COLORED ILLUSTRATIONS

AND

POPULAR DESCRIPTIONS

OF

PLANTS

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ERLANGEA TOMENTOSA

(Plate 417)

ERLANGEA TOMENTOSA

Winter Ageratum

Native of tropical Africa

Family CARDUACEAE THISTLE Family

Bothriocline Schimperi tomentosa Oliv. & Hiern, Fl. Trop. Afr. **3**: 266. 1877.
Erlangea tomentosa S. Moore, Jour. Bot. **46:** 158. 1908.

There has lately come into the horticultural trade and into private gardens the winter ageratum, which was introduced into England in 1907, by seed sent from British East Africa. *Erlangea* is a tropical African genus of about 30 species, and has come to include *Erlangea* proper, and, what is now a section of the genus, *Bothriocline*. The nearest relatives here are the vernonias or ironweeds, differing in the seeds and pappus bristles.

The uses in floral decoration of this lavender-pink subject were first brought to the notice of the American public by the eminent gardener James Stuart, in the American Museum of Natural History shows of the Horticultural Society of New York. His arrangements of this with other flowers were very attractively displayed.

The culture of this flower is that of a greenhouse eupatorium, or of the stevia of florists. It can be propagated from cuttings struck in spring, put in pots and shifted, until August and six inch pots are reached. They need to be pinched back several times, not overfed at least not until the blooming period, which is from December to April. The plants may be placed in the open ground from May to September, and are an excellent crop to follow chrysanthemums. Plate 417 was made from flowers grown in Conservatory Range No. 2, the plants coming from Charles H. Totty's nurseries.

The winter ageratum is a shrub up to five feet high, with furrowed and villous branches, the branchlets, petioles, and pedicels covered with close white tomentum. The leaves are alternate or the very uppermost seemingly opposite. They are ovate to lanceolate, with cuneate or somewhat rounded bases and acute apices; their margins are serrate; the midvein and twenty to thirty lateral veins are very prominent. Their upper surfaces are green, slightly softly hairy when young; the lower surface white with a close tomentum. The flower heads are in terminal corymbs, or in the upper axils; they are one half of an inch long and one fourth of an inch in diameter, and contain each about twenty florets, surrounded by a cup-shaped

involucre of three or four series of villous, scarious-margined bracts, the upper series often with petal-like, faintly colored tips. The florets are perfect, about one fourth of an inch long, the corollas tubular, five-lobed, the tubes curved and enlarged somewhat above, and the five lobes about as long as the tubes. The two style-branches are slender and hairy; the anthers are linear, obtuse at the base. The achenes are small, club-shaped and truncate, and with a few loose bristles.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Summit of flowering stem. Figs. 2, 3.—Involucral bracts, × 3. Fig. 4.—Flower, × 3. Fig. 5.—Androecium, split open, × 6. Fig. 6.—Achene with pappus, × 6.


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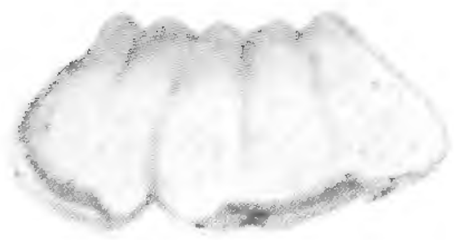
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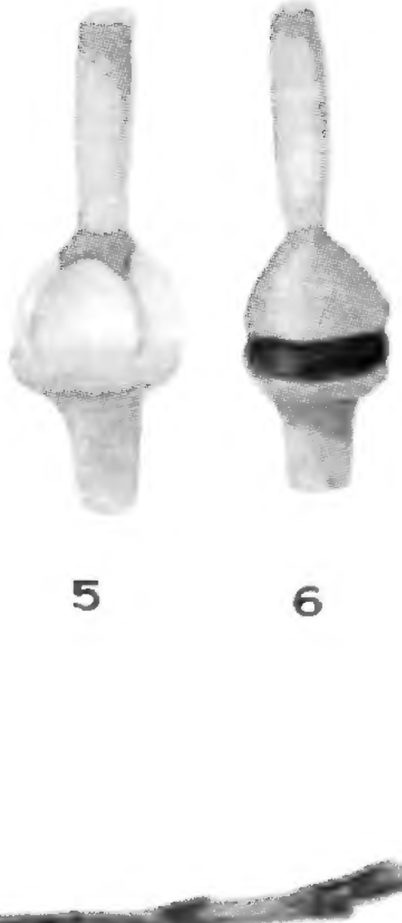
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7

(Plate 418)

UVA-URSI UVA-URSI

Bear-berry

Native of the Northern hemisphere

Family ERICACEAE HEATH Family

Arbutus Uva-Ursi L. Sp. Pl. 395. 1753.
Arctostaphylos Uva-Ursi Spreng. Syst. 2: 287. 1825.
Uva-Ursi Uva-Ursi Britton: Britt. & Brown, Ill. Fl. ed. 2. 2: 693. 1913.

When the great continental ice-sheet descended over our continent, plant life being exterminated in its wake, such plants as were able to adapt themselves temporarily to new habitats were the only ones able to survive. Some of the arctic plants thus driven far south of their range still persist in a few scattered places while the majority have returned to their natural homes, leaving a few way stations on high mountain tops to mark their path of migration. The bear-berry and the broom-crowberry (*Corema Conradii*) are the two most phenomenal of the group, for while other plants sought out the high peaks of the southern Appalachians for their temporary homes, these two plants singled out the stretches of hot, white, and so called barren sands of southern New Jersey for theirs, and there they still persist, although they have also spread back into their original habitat, and left scattered stations along the way as evidence. The islands of Nantucket and Martha's Vineyard are also relics of this southward retreat, and there also, the vine is as ubiquitious as it is in New Jersey, for where it forms great carpets on the sand, nothing else can grow, and insects and small animals use its dense shade for shelter from the burning rays of the sun in summer.

In earliest spring, by searching carefully among the leaves, one finds the clusters of tiny urn-shaped flowers, with their pink-tipped corollas, as delicate and dainty a flower as may be found anywhere. In the pine-barrens, where our familiar early spring flowers are lacking, they are replaced by the subject of this sketch and the pyxie (*Pyxidanthera barbulata*). In winter, when the vines are covered with their bright-red berries, it is again an attractive sight, and since the berries persist all winter, a patch is never without some color, and, too, the leaves take on a reddish-bronze color in winter, thus giving a warm appearance to the whole plant.

The leaves are used medicinally as an astringent tonic, especially in bladder affections.

The name is derived from the Latin word for a bunch of grapes, hence berry; and the word for bear.

The plant is so nearly impossible to transplant, that anyone contemplating cultivation should raise it from seed to insure its living. It makes a very desirable ground cover, over dry or rocky places, and since it is evergreen, need not be covered, so that it may give color to the garden all year.

The natural range of the plant is throughout the northern latitudes, ranging south in the eastern United States to southern New Jersey and northern Pennsylvania, and west to Illinois, Michigan, Nebraska, Colorado, and northern California. It grows, in its typical range on windswept mountain tops and rocky coasts, or similar situations.

The bear-berry is an evergreen, trailing shrub, with rooting branches covered with brown, tardily exfoliating bark. The growing ends of the branches are puberulent, curved upwards, reddish-tinged or green. The leaves are alternate, three quarters of an inch long, the blades entire, spatulate or obovate, coriaceous, rounded at the tip, dark green above, paler beneath, shining on both sides, tapering at the base into a petiole about one eighth of an inch long. The flowers, which come from buds formed the preceding season, are small, in terminal, few-flowered racemes, on slender nodding pedicels, with two bracteoles at the base, and borne in the axils of persistent, triangular, acute bracts shorter than the pedicels. The calyx consists of five broadly ovate sepals, the lobes rounded, red-tinged and glabrous, but ciliate on the margin. The corolla is about one fourth inch long, white, tinged with pink, urceolate, the five small lobes rounded and recurved at the tip; it is glabrous outside, but the inside covered with long, fine hairs. The androecium consists of ten included stamens fastened to the base of the corolla-tube. The filaments are white or pink-tinged, much dilated and hairy at the base, becoming abruptly slender above. The anthers are dark brown, two-celled, each cell with a recurved dorsal awn, and opening by terminal pores. The ovary is glabrous, seated within a dark brown, ten-lobed disk, the ovules solitary in each of the four to ten cells. The style is slender, columnar, reaching to the recurved tips of the corolla-lobes. The stigma is green, existing as a very slightly enlarged tip to the style. The fruit is a globose, somewhat depressed, bright red berry, seated on the persistent calyx. The pulp is bitter and astringent, the four to ten nutlets separable, rounded on the back and one-nerved.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Corolla, spread open, × 2. Fig. 3.—Stamens, × 4. Fig. 4.—Pistil with calyx closed over it, × 4. Fig. 5.—Pistil, with calyx removed to show ovary and disk. Fig. 6.—Branch in fruit, with next season's flower-buds formed.

BUDDLEIA ASIATICA

(Plate 419)

BUDDLEIA ASIATICA

White Butterfly-bush

Native of China, India, and Java

Family LOGANIACEAE — LOGANIA Family

Buddleia asiatica Lour. Fl. Cochinch. 72. 1790.

The genus *Buddleia* (named for the Reverend Adam Buddle, a British botanical author of the late 17th and early 18th century) is represented in our gardens by the fragrant butterfly-bush or summer lilac (see ADDISONIA, PLATE 45). Many other species, chiefly Asiatic, are entering collections: that at the New York Botanical Garden now contains about ten species. Three others have been long cultivated in greenhouses. The first of these, *Buddleia Colvillei*, is at once the most beautiful and the most difficult to flower. Unsuccessful attempts have been made to obtain plants of this for our collection, also of *B. globosa* of South America, with orange flowers in clusters, which has proved hardy in parts of England. *B. officinalis*, introduced by Mr. E. H. Wilson, is another example of species tender in our climate; growing in Florida and California gardens, it may prove an excellent subject for coolhouse culture. There have been interesting hybrids cultivated in England, sorts with golden yellow spikes, from *B. globosa* × *B. Davidi magnifica* crosses.

The white butterfly-bush is a very great addition to our winter flower garden. It is first acceptable for its fragrance; which has lately been called "lilac", and likened to familiar scents. Powerful but not heavy, one might rather call it a distinct perfume, buddleia, which gives us scented bouquets before freesias are available. The blooming period covers December, January, and February, following the chrysanthemum. The flower-spikes are very long, gracefully hung and plentifully produced, lending themselves to many cut-flower arrangements. Propagation is rather simply effected by means of cuttings taken from February to April. Young plants are grown in cool house, or frame, or are advantageously planted out in the garden during the summer, being brought in before cold weather. Plants are to be found blooming throughout the winter in Conservatory Range No. 2; from these the present illustration was made.

Buddleia asiatica is a low arching shrub from four to eight feet high, with opposite green and white leaves and fragrant white flowers in panicles of terminal and upper axillary long drooping spikes. The slender stems are densely grey or white tomentose. The opposite leaves are green above, with scarce tomentum, and covered beneath with a dense though loose short white tomentum. The upper leaves have slightly clasping bases, these connected by stipular lines. The lower leaves are sessile, linear, entire or with faint irregular teeth; they have acute to acuminate apices and measure from two to six inches long and up to three fourths of an inch wide. The flowers are tubular, less than one inch long. The calyx is cup-shaped, tomentose, with five acute short lobes. The corolla is about one half an inch long, the tube cylindric, tomentose, cream-colored, the throat and inner surface yellow and hirsute, the lobes spreading or slightly incurved, somewhat hirsute. The four anthers are attached to the inner wall of the tube, within the throat, on short filaments. The ovary is two-celled, many-ovuled, and the capsule two-celled, glabrous, ellipsoid, with numerous minute seeds.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Summit of flowering stem. Fig. 2.—Portion of stem, with leaves. Fig. 3.—Corolla, split open, showing stamens, × 2.

BASELLA RUBRA

(Plate 420)

BASELLA RUBRA

Malabar-nightshade

Native of Asia and Africa

Family BASELLACEAE — MADEIRA-VINE Family

Basella rubra L. Sp. Pl. 272. 1753.
Basella alba L. Sp. Pl. 272. 1753.

The genus *Basella* contains a single species and several varieties, which are natives of the warmer parts of Asia and Africa. They are cultivated in tropical and subtropical regions nearly throughout the world, and have become naturalized in some parts of tropical America. In our northern latitudes *Basella* is grown out-of-doors during the summer months and in conservatories in winter. Basella is said to be the native Malabar name. In Ceylon and India several forms are commonly grown and the succulent leaves used as a pot-herb by natives of all classes. The juice of the leaves is used in native practice in catarrhal affections of children. The Madeira- or Mignonette-vine, which is also a twiner, and found from Mexico to Argentina, is a close relative of the Malabar-nightshade.

Basella rubra is a much-branched twining succulent herb one meter or more in length. The ascending or spreading alternate leaves are glabrous. The entire ovate, oval, or orbicular petioled leaf-blades are from two to six inches in length, and one and a half to five inches broad. They are usually rounded at the apex and heart-shaped at the base. The flowers are perfect, in axillary peduncled spikes three to six inches long. The calyx-lobes are two, the tube adnate to the corolla. The corolla is urn-shaped with five broadly oval segments. The five stamens are erect in the bud, and inserted near the top of the perianth-tube. The ovoid ovary is rather fleshy and bears three linear stigmas at its summit. The globose utricle is completely enclosed in the enlarged fleshy perianth which adheres to the erect nearly round seed.

PERCY WILSON.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Fruiting branch. Fig. 3.—Stem of the green-stemmed variety. Fig. 4.—Flower. Fig. 5.—Flower, cut open. Fig. 6.—Calyx-lobe and one corolla-lobe.

VIBURNUM CARLESII

(Plate 421)

VIBURNUM CARLESII

Fragrant Viburnum

Native of Korea

Family CAPRIFOLIACEAE HONEYSUCKLE Family

Viburnum Carlesii Hemsl. Jour. Linn. Soc. **23**: 350. 1888.

The Asiatic species of *Viburnum* illustrated heretofore in ADDISONIA are *V. dilatatum* (PLATE 161) and *V. Sieboldii* (PLATE 178).

V. Carlesii is one of the endemic Korean plants which came into cultivation by way of Japanese gardens, as is *Cornus officinalis*, late-winter blooming shrub, which has been recorded in our collections as being native of Japan, but which Mr. E. H. Wilson has found to be Korean. He considers the fragrant viburnum the most attractive of Korean shrubs. It was named for its first collector, William Richard Carles, of the British consular service, at that time stationed in Korea. It is related to *Viburnum cotinifolium* from the Himalayas, to the American hobblebush, *V. alnifolium* and to the Wayfaring tree, *V. Lantana*. All these have naked winter buds; *V. Carlesii* has a distinctly cylindric tube to the corolla, and a distinct fragrance.

Seeds of this shrub were first sent to Kew by L. Boehmer & Co. of Yokohama, in 1902, collected for them by A. Unger in Korea. The Royal Horticultural Society of England gave an award of merit for this shrub at an exhibition meeting in April, 1908, and again in 1909. It has proved hardy in England and Ireland, where it flowers in April and May.

In American gardens this is the first viburnum to bloom, coming in May before the doublefile viburnum. This early flowering quality, the dwarfness of the plant and the delightful fragrance make the shrub desirable for garden purposes. The buds and outside surfaces of the flowers are pinkish, the fully expanded flowers white and the clusters compact. Plants may be now obtained from various nurseries. The material from which our illustration was taken was obtained from Bobbink and Atkins in 1915.

The fragrant viburnum is an upright but rather dwarf shrub, the branches terete, the branchlets angled and densely stellate-tomentose. The leaves, on short petioles, are broadly ovate, abruptly acuminate to obtuse-mucronate, and irregularly toothed. Their surfaces are both covered with stellate pubescence, when young with

a grey felty tomentum, especially beneath. The flowers are in small terminal globular cymes. They are glabrous, with salverform corolla, the tube cylindric, one third of an inch long, the limb five-lobed, the lobes spreading and rounded. The stamens are included, the style is short and thick, with a capitate stigma. The fruit is an ovoid, bluish-black berry.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Corolla split open, showing stamens. Fig. 3.—Flower, with corolla removed, and two bracteoles.

VERBENA HASTATA

(Plate 422)

VERBENA HASTATA

Blue Vervain

Native of North America

Family VERBENACEAE — VERVAIN Family

Verbena hastata L. Sp. Pl. 20. 1753.

When the growing time of the year passes its zenith and starts on the wane, the cooler colors of spring and summer begin to give way to the royal colors of autumn—purple and gold. Here and there the fields and meadows that have been green so long, begin to be flecked with the gold of the earlier goldenrods. Since the asters bloom later, their place in the color scheme of nature is filled in by the ironweeds (*Vernonia*), and the verbena here illustrated, which livens up the edges of lakes, ponds and streams, and runs rampant through the marshes, flashing its brilliant purple for the notice of any passerby, as if it sought to rival the glorious cardinal flower (*Lobelia cardinalis*). The damp margins of pasture lands are also favored localities of the verbena, for there, competition is lessened, and it stands a better chance of spreading its progeny.

Of the native verbenas, only one other species rivals this in beauty, *V. stricta* of the Mississippi Valley; the other species are all more or less pale colored and inconspicuous.

The species here discussed is really the most brilliantly colored of its genus in the northeast and possibly the southeast as well, and for its blooming season and color would be well worth cultivation, were it not so weedy and inclined to spread much too rapidly for a desirable garden plant.

The name *Verbena* is the Latin name applied indiscriminately to any sacred herb or plant; and, as the European *V. officinalis* was sacred to the Druids, herbalists applied this name to it.

The common name vervain, which has been applied also to the American species, is thought to be from the celtic word ferfaen, from fer, to remove, and faen, stone, as *V. officinalis* was once used in bladderstone treatment, as well as a treatment for sore eyes, and numerous other ailments. The plant collected with certain rites was also worn to avoid disaster.

The natural range of *V. hastata* is from Nova Scotia to British Columbia, and south from California to Florida, or throughout the United States and southern Canada. Its habitat is damp meadows,

stream banks, pond and lake margins, swamps and moist pasture lands, and any other place where moisture is present the year round.

The blue vervain is a perennial herb arising from short woody rootstocks. The sharply four-angled, somewhat rough-pubescent stems grow from two to four feet tall and are usually in clumps. The simple stems branch near the top into a paniculate inflorescence. The leaves are opposite, dark green above, lighter beneath, slightly rough-pubescent on both surfaces. The petioles are one half to three quarters of an inch long. The blades vary in outline from lanceolate-ovate to hastate, from three to six inches long, serrate with very prominent, flaring teeth. The leaves at about the middle of the stem are the largest and become smaller both towards the top and the base. When growing in full sunlight, the entire plant is often suffused with a purplish tinge. The flowers are borne in a dense panicled inflorescence, the branches of which are two to six inches long and are each subtended by a slender, lanceolate bract. The flowers are each subtended by an ovate-lanceolate bractlet shorter than the calyx. The calyx is pubescent, tubular, with five triangular, subulate-tipped teeth of three different lengths, and becomes at maturity about one eighth of an inch long. The corolla is bright violet-purple (rarely pink or white), about one fourth of an inch long, the slender curved tube pubescent at the throat within and on the outside, and expanding abruptly into the five-parted, slightly irregular limb about one fourth of an inch across. The stamens are didynamous. The filaments are very short and adnate to the throat of the corolla. The anthers are two-celled and yellow, the sacs opening longitudinally. The stigma is two-lobed, one lobe being capitate and larger than the tooth-shaped smaller one, the capitate lobe alone being stigmatic. The style is slender, about three fourths of the length of the corolla tube, and is terminal on the four-celled ovary, which dehisces at maturity into four slender black nutlets. The aggregate of nutlets is wholly included within the matured calyx, the inflorescence forming in fruit the same dense, uninterrupted spike it forms when in flower.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Summit of flowering stem. Fig. 2.—Corolla, ×3. Fig. 3.—Corolla split open, showing stamens, ×3. Fig. 4.—Fruiting calyx, ×5. Fig. 5.—Fruit, ×5.

TRACHYMENE COERULEA

(Plate 423)

TRACHYMENE COERULEA

Blue Laceflower

Native of Australia

Family AMMIACEAE — CARROT Family

Trachymene coerulea Graham, Edinb. New Phil. Jour. **5**: 380. O 1828.
Didiscus coeruleus DC.; Hook. Bot. Mag. *pl. 2875*. D 1828.

Several years ago when the seedsmen were looking for some novelty, the blue laceflower was introduced. This proved to be an old friend, *Trachymene coerulea*, which had flowered in the collections of the N. Y. Botanical Garden during many summers, the plants grown from seeds received from European botanic gardens. This flower has made a popular appeal as a summer annual; and of late as a florist's flower for winter, being used in wedding bouquets somewhat this season.

The first record of its cultivation seems to be in 1827, when seed was brought from New South Wales. In this country it had been grown in 1896, at Smith College Botanic Garden, and perhaps previous to that in other Massachusetts gardens.

The genus *Trachymene* contains a dozen Australian species, and some others, of umbelliferous plants closely related to *Hydrocotyle*, the Marsh Pennywort. Oil-tubes, so conspicuous in many genera of this family, are lacking in *Trachymene*, and the flowers are arranged in simple umbels. They are on long stems and lend themselves to cutting in the flower garden, where their color is desirable at the season, late summer, when they bloom.

Seeds of the blue lace-flower may be sown in March in a hot bed. When seedlings are large enough they should be transplanted to flats or boxes, finally to the open border in May; or the seed may be sown directly in the seed bed or garden in April or May.

The blue laceflower is a coarse annual up to two feet high. The stems, branches, petioles, and peduncles are softly hirsute, as are the leaves. These are ternately divided and pinnatifid, or the upper obscurely three-parted. The flowers are numerous, in simple umbels from two to three inches in diameter. The umbel is subtended by numerous linear, long bracts, the bracts united at their bases, and about as long as the rays of the umbel which are attached at its center to a flat green disc. The petals are five in number, blue, rounded, unequal, with the outer two larger than the inner three. The fruit, with persistent style, is laterally com-

pressed, each half with three main ribs, the center rib prominent; containing no oil-tubes.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Summit of flowering stem. Fig. 2.—Lower leaf. Fig. 3.—Flower, ×2. Fig. 4.—Ovary, with stylopodium.

LIGULARIA KAEMPFERI AUREO-MACULATA

(Plate 424)

LIGULARIA KAEMPFERI AUREO-MACULATA

Leopard-plant

Native of Japan

Family CARDUACEAE — THISTLE Family

Farfugium grande Lindl. Gard. Chron. 1857: 4. 1857.
Ligularia Kaempferi aureo-maculata Hook. Bot. Mag. *pl. 5302*. 1862.

The genus *Ligularia* as understood to horticulture includes a few species of robust Asiatic herbs, most of them grown in coarse borders of aquatic plantings. The Chinese *L. Veitchiana*, with large yellow flowers; *L. clivorum* of Japan and China, with large orange flowers; *L. Wilsoniana*, with large leaves and spikes of flowers; and *L. japonica*, a cut-leaved species, are known in gardens.

The leopard-plant is one of the neglected old variegated plants which are not grown as much as formerly. A green-leaved form, which may be seen growing with the present subject in Conservatory Range No. 2, a white-spotted form, and one with pink spots are to be occasionally seen cultivated.

The interest or hobby of Japanese fanciers in the intense cultivation of certain plants like *Rohdea japonica*, or "Omoto," of which it is said they have had hundreds of varieties of leaf-forms, may account also for this leopard-plant being in their gardens. Another report credits the origin of the plant as introduced to English gardens by Robert Fortune from a Chinese mandarin's garden.

The leopard-plant is best propagated by division in spring, if possible putting the divisions in sand for a few weeks to get the roots started. It is grown in pots in a cool greenhouse in the vicinity of New York, but proves hardy south of Washington, and makes an excellent house-plant. A liberal supply of water is advisable during the summer, but not so much should be given at other times.

The leopard-plant is a perennial herb, from rhizomes, with radical leaves and clustered yellow flowers. The leaf stalks are about twelve inches long, reddish, loosely woolly, and the leaf blades are orbicular or reniform, strongly veined, six or more inches across, with repand margins; they are smooth above and loosely woolly below. The flowers, subtended by leafy bracts, are on two-foot long flocculent stalks, in heads which are about two inches in diameter, surrounded by cylindric involucres of bracts in one series, or the outer narrower than the inner and overlapping them. The ten to twelve ray florets are light yellow, pistillate, or with a rudi-

mentary stamen. They have ligulate corollas with short cylindric tubes, and limbs which are one inch long, ovate-lanceolate, bluntly three-toothed at the apex. The slender styles are exserted, with two recurving slender branches. The disk consists of many perfect tubular florets each with five acute corolla lobes, the anthers surrounding the slender styles in the throat of the tubes. Both ray and disk flowers develop four-angled, scabrous achenes, with pappus of many series of white barbed bristles.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Summit of flowering stem. Fig. 2.—Basal leaf. Fig. 3.—Ray-flower, × 2. Fig. 4.—Disk-flower, ×2.

AZALEA CALENDULACEA

(Plate 425)

AZALEA CALENDULACEA

Flame Azalea

Native of the Appalachian region

Family ERICACEAE HEATH Family

Azalea calendulacea Michx. Fl. Bor. Am. 1: 151. 1803.
Rhododendron calendulaceum Torr. Fl. U. S. 425. 1824.

In the southern Appalachians when the procession of the year brings around the month of June, the landscape is vivid with the color of hundreds of the choicest native plants of the east. Throughout the open woodlands and on mountain slopes, the splendid flowers of the flame azalea flash forth their challenge of glory to the purple rhododendron which crowns the high peaks. Each is supreme in its own domain, but to the azalea must be given the title of the most gorgeous shrub in the United States. There is nothing, even in the famed flower fields of the west, that surpasses it in beauty. Its splendor even delighted the early travellers, for Bartram speaks of it as "flaming on the ascending hills or wavy surface of the gliding brooks." "The epithet fiery, I annex to this most celebrated species of Azalea, as being expressive of the appearance of it in flower, which are in general of the colour of the finest red lead, orange and bright gold, as well as yellow and cream colour; these various splendid colours are not only in separate plants, but frequently all the varieties and shades are seen in separate branches on the same plant, and the clusters of the blossoms cover the shrubs in such incredible profusion on the hill sides, that suddenly opening to view from dark shades, we are alarmed with the apprehension of the hills being set on fire. This is certainly the most gay and brilliant flowering shrub yet known . . . . the young leaves are but very small while the shrubs are in bloom, from which circumstance the plant exhibits a greater shew of splendour."

The preceding quotation is about as eloquent a tribute as can be paid this plant, for it is still unrivaled for beauty and hardiness, and is much in demand by breeders who infuse its hardiness and color into other species more delicate or less brilliantly colored, thus producing many new and handsome forms for ornamental planting.

Many large estates have made extensive plantings of the shrub, brought straight from a wild state, and are thus preserving a priceless heritage, for the inroads on its natural habitats are increasing

so that it is even now much less plentiful than when it so delighted Bartram and other early travellers, and may have to be given protection eventually to save it from extinction in the wild state.

The plant grows in rich, usually rocky woods and mountain slopes, in acid soil; from Pennsylvania southward to Georgia and Alabama in the Appalachian mountains and the neighboring regions.

The flame azalea is a much branched shrub, up to ten feet high, the main stem and branches clothed with a light brown, thin, smooth bark. The branchlets of the season are coarsely pubescent. The leaves are two to four inches long, approximate at the ends of the twigs, or scattered on the longer shoots. The blades are obovate to oblanceolate, bright green, shining and glabrous above when mature, pubescent beneath when young, only the midrib pubescent when mature, the margin finely ciliate. The slightly scented flowers are borne five to fifteen in a cluster. The calyx is very small, five-lobed, glandular-pubescent as also are the pedicels, the calyx-lobes extending themselves into glandular hairs. The corolla is brilliant flame-orange, with the middle lobe of the upper lip yellow blotched, but the color varies from the palest of sulphur yellows, through all shades of yellow and orange into vermilion and scarlet. The corolla is slightly two-lipped, the middle lobe of the upper lip largest and ovate, the four remaining lobes broadly lanceolate. The tube is usually shorter than, or sometimes as long as the corolla-lobes, deeply five-ridged, becoming funnelform at the summit, the ridges extending into the limb, and closing the tube tightly about the filaments and style at their most pubescent point. The tube is exceedingly glandular-pubescent on the outside, the lines of pubescence extending down the middle of the corolla-lobes. The corolla-limb is one and a half to two and a half inches across, the tube three quarters of an inch to an inch long, pubescent inside between the ridges. The five stamens are very long, conspicuously exserted, the slender filaments fastened at the base of the corolla-tube and of the same color, and heavily pubescent for about half of their length, the pubescence extending beyond the point of exsertion. The anthers are various shades of yellow according to the color of the flower, two-celled, opening by terminal pores. The stigma is capitate and green. The style is pubescent at the base, about as long as the filaments and the same color as the corolla. The ovary is superior and five-celled, containing many ovules on parietal placentae; copiously pubescent, the hairs slightly gland-tipped. The fruit is a dry, ellipsoid capsule, three quarters of an inch to an inch long, hirsute, five-valved. The seeds are small and scale-like.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. **Fig. 1.**—Flowering branch. **Fig. 2.**—A pale-colored flower. **Fig. 3.**—Capsule, closed. **Fig. 4.**—Capsule, opened, the seeds scattered.

ADDISONIA

CONGEA TOMENTOSA

(Plate 426)

CONGEA TOMENTOSA

Lavender-wreath

Native of India and Siam

Family VERBENACEAE — VERVAIN Family

Congea tomentosa Roxb. Pl. Corom. 3: 90. 1819.
Roscoea tomentosa Roxb. Fl. Ind. 3: 56. 1832.

One of the several vines called "kungea" by the natives of countries where it grows has been imported by plantsman into America and is now in great demand for West Indian tropical gardens. Related to the cultivated genera *Clerodendron*, *Callicarpa*, *Caryopteris*, *Duranta*, *Lantana*, and *Vitex*, it resembles none so closely as it does the purple-wreath, *Petrea*. Unlike the last, which is one of our most brilliant tropical vines and owes most of its attractiveness to the rich colored calyces, *Congea* relies on colored bracts for floral attraction, and these bracts, which are curiously felt-like in texture, endure for many years. Sprays brought from Porto Rico in 1925 are still in use for study and house decoration. Their use as ornaments for hats and clothing may be expected in India and warm countries where it may grow in gardens.

As a conservatory vine in the North the lavender-wreath flourishes and flowers profusely; the bracts are perhaps less brightly colored than those of plants grown under tropic skies, but they are equally lasting in make-up.

Propagation is effected by layering or by cuttings of well-ripened wood. The plant from which the illustration for Plate 426 was made may be seen in house No. 13, Conservatory Range 1, New York Botanical Garden. It was brought from Porto Rico in 1925, in a bamboo pot, having been presented to Dr. N. L. Britton by Mr. O. W. Barrett.

The lavender-wreath is a scandent shrub, with pilose stems and branches and densely tomentose flowering branchlets. The leaves are ovate, acute to acuminate, with blades about five inches long and petioles about half an inch long. They are clothed with long loose tomentum above and a dense soft tomentum beneath. The flowers are sessile, along the ends of branchlets, in three-flowered to seven-flowered clusters, which are subtended by the enlarged colored bracts. The bracts are elliptic-oblong, about one inch long and one half inch wide, acute or occasionally two-lobed, densely white-tomentose, the veins prominent beneath. The calyces are funnel-shaped, densely soft hairy, with five unequal short sharp teeth. The

corollas are slender-tubed, two-lipped; the upper lip erect, of two linear-oblong lobes; the lower lip of three much shorter obovate lobes. The stamens are long-exserted.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Lower leaf. Figs. 3, 4.—Flowers, × 2.

SEDUM TERNATUM

(Plate 427)

SEDUM TERNATUM

American White Stonecrop

Native of eastern United States

Family CRASSULACEAE — ORPINE Family

Sedum ternatum Michx. Fl. Bor. Am. 1: 277. 1803.

The stonecrops are mostly low perennial or rarely annual herbs with fleshy leaves, loving stony or rocky places. In Europe they are exceedingly common, especially in the mountain regions and in the north. In some parts of Sweden every gravelly knoll is covered by the common stonecrop, *Sedum acre*, and on the glaciated cliffs its light green foliage and its bright yellow flowers are cropping out from every crack. On every pebbly beach and gravelly roadside, where nothing else will grow, there is a rich crop of this stonecrop and the knotweed, *Polygonum aviculare*.

The condition in North America is different. With the exception of *Sedum stenopelalum* of the Rocky Mountrins, the stonecrops of the United States are rather local. The eastern United States has only three native species of the stonecrops proper, if *Sedum telephioides*, which is known as "American orpine" and the roseroots are excluded. The most common of these is the American white stonecrop, also known as wild stonecrop. In England, where it is in cultivation, it has been known as "three-leaved American stonecrop" or "purslane-leaved stonecrop."

The specimen from which the drawing was made was collected by the author in the summer of 1925 on the northeastern slope of Snowy Mountain, West Virginia. The mountain is wooded to the top, but the woods are not very dense. Here and there are rock outcrops and on one of these the species was found growing luxuriantly in half shade. Some plants were sent to The New York Botanical Garden, where they flowered the following spring. I was surprised that a *Sedum* was growing in such a shady place, as all the species I was acquainted with grew in bright sunshine. I have found that this species, however, prefers rocky places with rich loam in open woods. It also thrives in damper places than most species do.

A painting of a single spray can not give due credit to the beauty of the plant in nature. As it grows in clumps, with numerous intricately interlacing pinkish branches of about equal height, some

ending in a rosette of bright green spatulate leaves, others bearing a three-forked flower-cluster, with white petals and pistils and crimson anthers, the whole forms a hemispheric cushion of beautifully mixed delicate colors.

The plant blooms from April to June. It is a native of rocky woodlands, mostly in the mountainous regions from New York to Georgia, Tennessee, and Michigan. It has been in cultivation since 1789, and is found occasionally as an escape.

Many of the species of *Sedum*, the stonecrops, and *Sempervivum*, the houseleeks, another genus of the same family, are cultivated in rock-gardens, in cemeteries, and as border plants. They are as a rule easily propagated, grow in poor soil, need little water, and practically no care; they are therefore rather popular. Though the individual flowers are small the forked flower-clusters with spray-like branches give a pleasant effect to a background of bright green leaves.

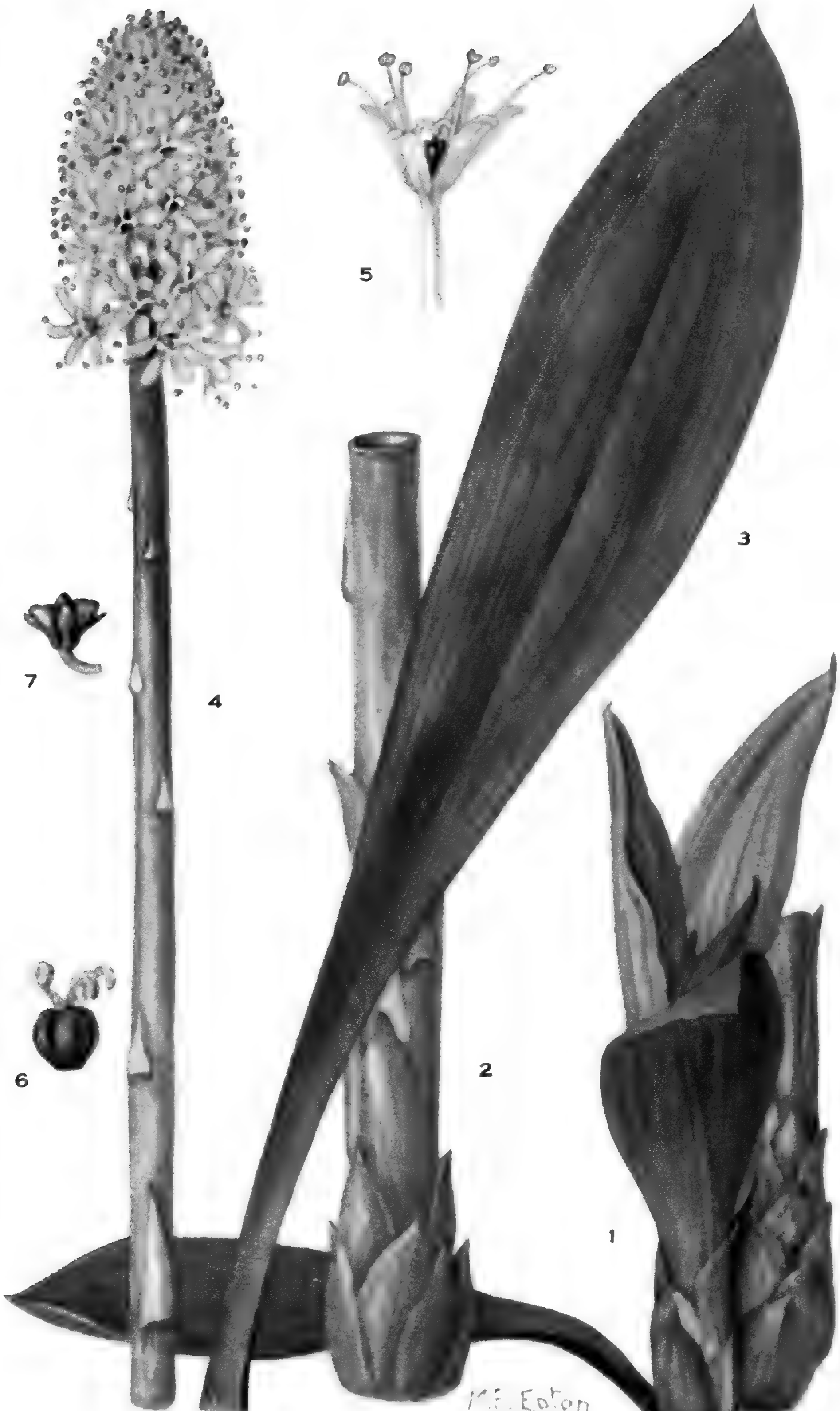
Sedum ternatum is a low tufted perennial with rootstocks. The stems are decumbent or creeping below, either above or under ground or through the leaf-mold, so there is no real distinction between stems and rootstocks or stolons. They root freely at the nodes. The sterile stems or branches if above ground bear their leaves in whorls of three. The leaves are obovate or spatulate, fleshy but flat, entire, one third to fully an inch long, with short fleshy stalks; the lower ones are small and more distant, those at the end much larger and clustered together. The flowering stems or branches are more erect and their leaves smaller; the lower ones are mostly in threes, the upper opposite or scattered. The flower cluster has three spreading branches with a single flower in the fork. The other flowers are sessile, arranged alternately along the branches, but only on the upper side. The flower in the fork is usually pentamerous, *i. e.* the sepals, petals and pistils are each five, the stamens ten, in two series of five. The rest of the flowers are tetramerous, *i. e.* the parts are in fours (stamens of course eight). In most species of *Sedum*, the flowers are all pentamerous. The sepals are oblong, about one fifth of an inch long, blunt. The petals are twice as long, white, linear-lanceolate, acute. The filaments of the stamens are awl-shaped, and white; the anthers are crimson. The follicles (parts of the fruit) are at first white but turn brown in age and become widely spreading

P. A. RYDBERG.

EXPLANATION OF PLATE. **Fig. 1.**—Flowering and sterile branches. **Fig. 2.**—Flower, laid open, × 2. **Fig. 3.**—Young follicles, × 2. **Fig. 4.**—Mature fruit, × 2.

PLATE 428

ADDISONIA



HELONIAS BULLATA

(Plate 428)

HELONIAS BULLATA

Swamp-pink

Native of northeastern United States

Family MELANTHIACEAE BUNCH-FLOWER Family

Helonias bullata L. Sp. Pl. 342. 1753.

Deep in the cedar swamps of the pine barrens of the Atlantic Coastal Plain, where the shady pools are guarded by the dark trunks of the white cedar, which stand, rank on rank, straight, stiff, and silent sentinels, except when the passing wind whispers in their branches, the swamp-pink is at home, and its brilliant pink spikes give the only touch of brightness to the gloomy depths. In clustered tussock-like colonies they grow, around the edges and far out into the forest depths, where often they form a sea of pink, over which many insects hold frolic, for there are few other plants in flower at this early season. In fact, they seem to enjoy the deeper shade best, for there they reach their tallest growth and are deepest in color, as in the sun they are lower-growing and a rather washed-out pink.

As for choice of habitat, this plant has an unbelievable fondness for the state of New Jersey, and is not at all common outside of its chosen ground. Indeed, the pine-barren swamps of southern New Jersey are the only places where it reaches perfection of growth naturally, and there it is locally plentiful. Besides the pine-barrens, it is known from only two or three localities in the northern part of the state, a few places in Delaware and possibly Maryland, and then makes a jump to the high mountain swamps of North Carolina, where it reaches its southern limit. One known station on Staten Island has now disappeared.

The plant is, however, easy of cultivation, if only given a soft acid loam to grow in and a fair amount of moisture. It is cultivated quite often in England as a border or rock garden plant, as well as in this country north of its natural range. The earliness of bloom as well as its attractive color makes it a desirable plant, and it deserves to be better known to gardeners who have suitable places for its growth. It is quite hardy, the evergreen leaves lying flat on the ground through the winter.

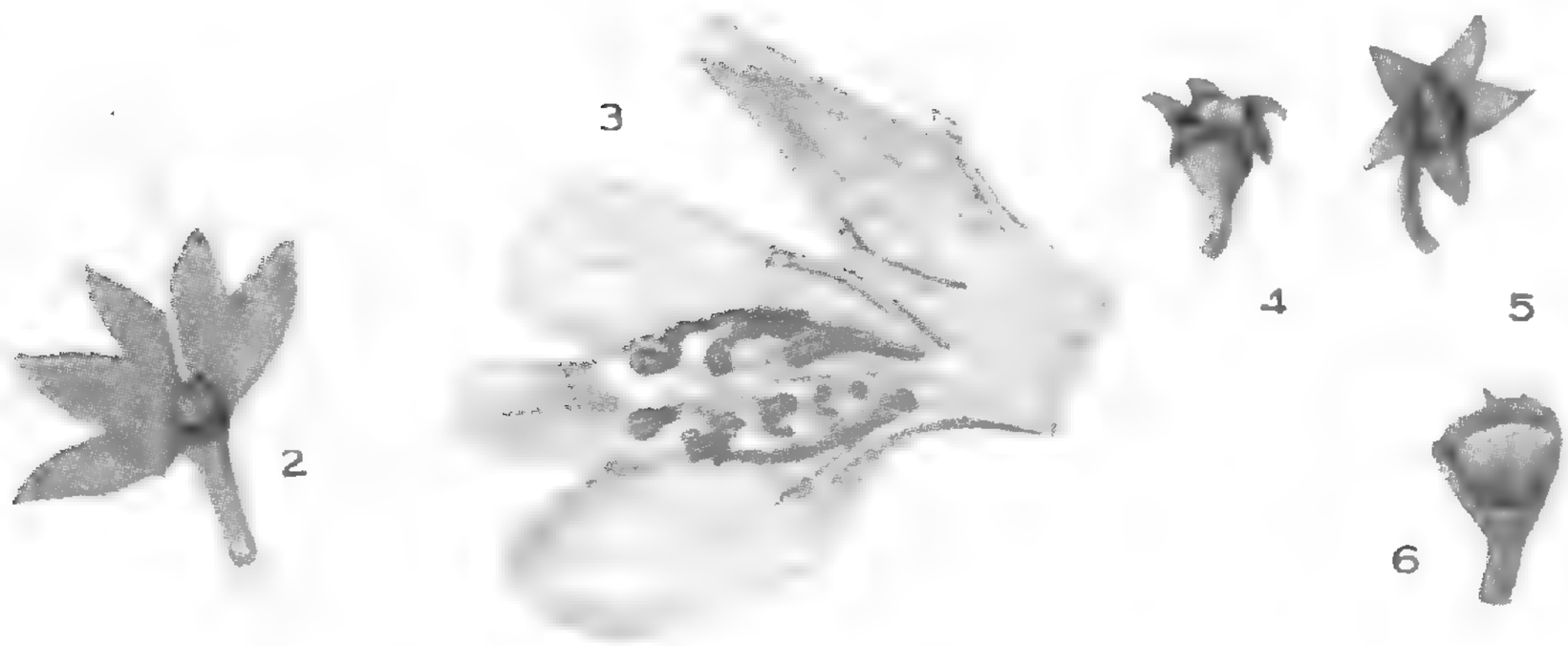
The name *Helonias* is thought to be derived from the Greek word *helos*, a swamp, in allusion to its place of growth.

The natural range of the plant is from New Jersey and southern New York (Staten Island) south to Delaware or Virginia on the Coastal Plain and in the Blue Ridge mountains in North Carolina, but always in acid bogs and usually accompanied by the pitcher-plant (*Sarracenia purpurea*), golden-club (*Orontium aquaticum*) and leather-leaf (*Chamaedaphne calyculata*).

The swamp-pink is a perennial scapose herb with numerous thick fibrous roots. The leaves are very numerous, dark green, tinged with red when mature, but light green when young, ten to twenty inches long in full grown plants, lanceolate-spatulate, narrowing to a broadly margined petiole which again broadens at the attachment point. The leaves lie flat on the ground, the two new leafy shoots of the year rising from their center, and between them rises the flowering scape, which begins to bloom as it first reaches the level of the new leaves, and then continues to elongate to from two and a half to three feet, when all the flowers are expanded. The scape is hollow, covered with long obovate bracts at the base, the bracts becoming lanceolate, and further apart as they approach the top of the scape, until below the flower head they are mere scales. The flowers are rose-pink, in a very compact spike two to two and a half inches long, each individual flower three eighths of an inch across. The perianth is six-parted, the lobes lanceolate, blunt at the tip, one fourth inch long. The pedicel is the same color and length as the flower, and is hollow. The six stamens are fastened at the base of the perianth lobes. The filaments are pink, slightly longer than the perianth lobes. The anthers are oblong before anthesis, light blue becoming darker blue afterwards, the pollen white. The three stigma-branches are recurved, pink, and separate nearly to the base. The style is very short and thick. The ovary is deeply three-lobed, dark greenish red, three-celled, with many ovules on axial placentae. The fruit is a sharply three-lobed and three-celled capsule, ventrally dehiscent above, seated in the persistent perianth. The filaments are also persistent, and along with the perianth become green. The seeds are numerous and very small, white-appendaged at both ends forming a slender linear body, which is easily spread with the help of the wind.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A new shoot of the year, showing the base of the flowering stalk and an old leaf. Fig. 2.—The lower part of the flowering stalk. Fig. 3.—A mature last year's leaf. Fig. 4.—The upper part of the flowering stalk and inflorescence. Fig. 5.—A flower, × 2. Fig. 6.—The gynoecium, × 3. Fig. 7.—The mature capsule in the perianth.



MAZUS JAPONICUS

(Plate 429)

MAZUS JAPONICUS

Oriental Mazus

Native of southeastern Asia

Family SCROPHULARIACEAE — FIGWORT Family

Lindernia japonica Thunb. Fl. Jap. 253. 1784.
Mazus rugosus Lour. Fl. Cochinch. 385. 1790.
Mazus japonicus Kuntze, Rev. Gen. 462. 1891.

This dainty little plant, so much desired for rockgardens, was first described by the botanical traveler, C. P. Thunberg, who observed it in Japan in 1775 or 1776, growing in the crevices of walls. He considered it an eastern ally of the European *Lindernia pyxidaria* L., but it was more correctly assigned independent generic status six years later by Loureiro. Father João de Loureiro was a Catholic missionary to Annam, where he passed thirty-six years; and it is quite likely that his discovery of our plant actually antedated that of Thunberg. The oriental mazus is such a widespread weed through much of southeastern Asia from India to China and Japan, and on the Malayan islands, that its independent discovery was most natural.

Seeds sown in hot bed or greenhouse will germinate readily, the seedlings being transplanted thence to the rockgarden. Seedlings will spring up each year; if these are collected a sufficient group can be made to give a good deal of color to the garden in June and later. Plants were first placed in the Rock Garden of the New York Botanical Garden in 1922, from the collection of Mr. Clarence Lown.

The oriental mazus is an annual herbaceous plant, from a rosette-like cluster of leaves sending out a number of spreading, ascending branches that terminate in lax, nearly bare racemes. The lower part of the stems and the leaves are loosely pilose, while the upper part of the stems, the pedicels and the sepals are minutely pubescent. The leaves are opposite, the lower on petioles nearly as long as the blades, the upper sessile, all with oval blades that are distally irregularly and broadly dentate. Sometimes the uppermost leaves are subopposite or scattered, and the flowers are always scattered or alternate on pedicels that are three to five times the length of the inconspicuous subulate bracts. The sepals are ovate and united into a tube for half their length. The corolla, nearly half an inch long, is two-lipped, the upper recurved, bifid, much shorter than the broadly expanded lower lip; in color it is violet-blue, except on the raised palate of the anterior lip, which is pale and conspicuously mottled with spots that are yellow, bordered by red-brown. The four stamens are glabrous throughout, the posterior pair shorter

than the anterior. The two stigmas are flat and widely expanded, borne at the apex of the slender wholly united styles. The rounded and glabrous capsule splits loculicidally, even dividing the septum between the two cells into two halves. The seeds are many, minute, reticulate but with the longitudinal markings rather more prominent than the transverse.

FRANCIS W. PENNELL.

EXPLANATION OF PLATE. Fig. 1.—Flowering plant. Fig. 2.—Flower, with corolla and stamens removed, and calyx split open, × 2. Fig. 3.—Corolla, split open, showing stamens, × 2. Figs. 4, 5.—Fruit. Fig. 6.—Fruit, with calyx cut away, × 2.

SALIX CAPREA ELLIPTICA

(Plate 430)

SALIX CAPREA ELLIPTICA

Goat Willow

Native of Europe and Asia

Family SALICACEAE — WILLOW Family

Salix caprea elliptica Kerner, Verh. Zool.-Bot. Ges. Wien 10: 248. 1860.

The goat willow is one which has furnished several well-known cultivated varieties. *Salix caprea pendula*, the Kilmarnock willow, is a dwarf weeping grafted form formerly much planted in yards and gardens. Apparently these were once extensively planted in the regions of the Bronx adjacent to the New York Botanical Garden, as plants of the ordinary upright form, representing the stock upon which the weeping variety was at that time grafted, are to be seen in many yards, furnishing in March aud April fine large catkins.

The other commonly planted weeping willow, *Salix babylonica*, has held the interest of plantsmen for many years, but the early spring interest in sprays of "pussy willow" has brought attention to the present subject and other species. It is one of those grown commercially for the florist trade. In Great Britain, where it grows in moist places and is the earliest to flower, this is the common "sallow," and the flowering branches are called "palm" by the country people. As with other willows the staminate trees are the more showy, the catkins gaudy with yellow stamens and reddish anthers after a long season of silvery "pussies." The flowers are attractive to the earliest bees and are excellent for cutting for house decoration.

Salix caprea elliptica is a shrub or small tree with erect terete branches, brown, pubescent twigs, and buds reddish and downy. The leaves are simple, serrate, narrowly elliptic, narrowed at base and acute, deep green and nearly smooth above and whitish downy and veiny beneath. There are two halfmoon-shaped, serrate stipules at the base of each petiole. The dioecious flowers are in large thick aments, sessile on the ends of branches, the staminate with many flowers each with a long fringed blackish scale subtending two much longer stamens, the filaments white and the anthers reddish and showy. The pistillate flowers have green, black-tipped, ovate-lanceolate, silky-hairy scales, subtending grey silky ovaries with bifid yellow stigmas. The beaked capsules are one third of an inch long, on slender pedicels as long as the scale.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Part of leafy twig. Fig. 2.—Staminate inflorescence. Fig. 3.—Staminate flower, × 4. Fig. 4.—Pistillate inflorescence. Figs. 5, 6.—Pistillate flowers, × 4.

GREWIA PARVIFLORA

(Plate 431)

GREWIA PARVIFLORA

Small-flowered Grewia

Native of North China and Korea

Family TILIACEAE — LINDEN Family

Grewia parviflora Buege, Enum. Pl. Chin. Bor. 9. 1831.

The genus *Grewia*, named in honor of Nehemiah Grew, an English physician and vegetable physiologist, contains about seventy species of shrubs, mostly found in warm climates. A few species like the present one have been tried under cultivation in temperate zone gardens and found to be reasonably hardy.

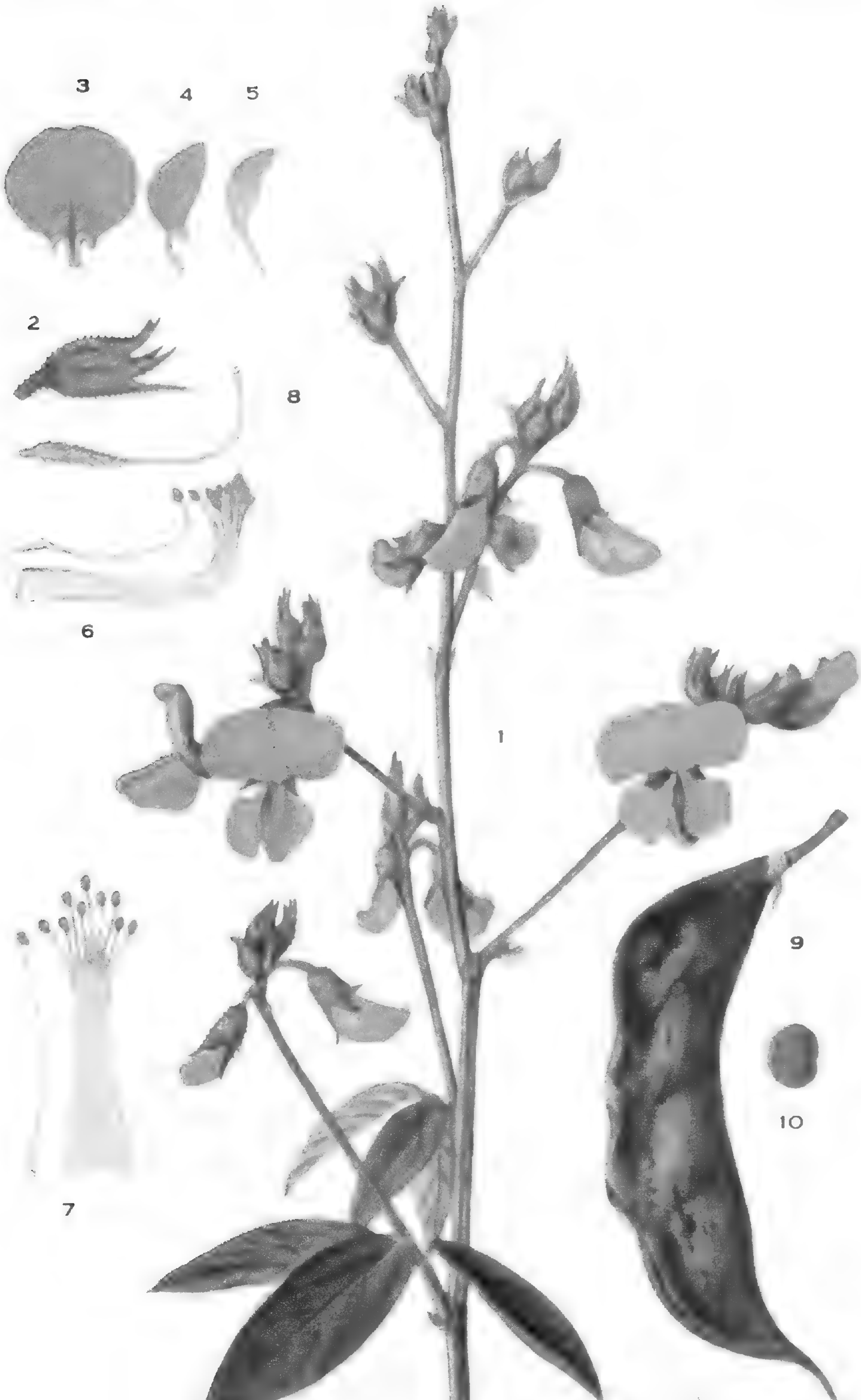
When this shrub blooms in June and July it can scarcely be called an addition to our ornamental shrubbery, as the flowers are rather inconspicuous. It has been the fruiting season that has suggested possible development of the subject as an attractive fruiting shrub, the color of the fruit being rather unusual and the lasting qualities rather pronounced; the birds of this region do not seem to care for it.

Propagation is by seeds, which germinate rather slowly, or by cuttings of new wood taken late in the year. The plant from which *plate 431* was made came from Washington in 1917, being one of the introductions of the Bureau of Plant Industry, United States Department of Agriculture. It is planted in the Fruticetum of the New York Botanical Garden.

Grewia parviflora is a spreading shrub with glabrous branches and branchlets. The leaves, which unfold in May, are ovate, serrate, acuminate, being occasionally somewhat lobed, hispidulus above, canescent beneath. The flowers are few, aggregated at the ends of branches or axillary. The calyx is of five distinct, greenish, lanceolate, acuminate sepals; the petals are five, smaller than the sepals and much shorter, each with a fringed gland at the base. There are about forty stamens, with round four-celled yellow anthers; and the stigmas are four-lobed. The fruit is a four-parted berry containing four seeds, or may be reduced to a single-celled roundish berry with one seed.

KENNETH R. BOYNTON.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Sepal, × 3. Fig. 3.—Petal, × 3. Fig. 4.—Pistil, × 3. Fig. 5.—Fruiting branch.



CAJAN CAJAN

(Plate 432)

CAJAN CAJAN

Pigeon-pea

Native of India (?) or Africa (?)

Family FABACEAE — PEA Family

Cytisus Cajan L. Sp. Pl. 739. 1753.
Cajanus indicus Spreng. Syst. 3: 248. 1826.
Cajan Cajan Millsp. Field Mus. Bot. 2: 53. 1900.

Plants whose native country is veiled in the past are always interesting no matter how plain they may be in appearance. Through the warmer parts of peninsular Florida, one sees the tall bush-like plants of this pea, with their numerous bright yellow flowers contrasted against the weather-worn or whitewashed shanties of the negroes, who seem to be the only people in America who really enjoy this plant as a food.

But in far away India, it is one of the most important of food plants, making a pudding but little inferior to that made from peas. Here it is commonly cultivated throughout the country up to an altitude of six thousand feet. There are two varieties common in cultivation; one, the variety *flavus* has the flower entirely yellow within and without, and is known in the vernacular as "thúr"; the other, the variety *bicolor*, has the standard veined with purple on the outside and is known as "arhar." The seeds are separated from the pods by beating, then mixed with red earth to give a bright color, and steeped in water until germination takes place. They are then removed, dried in the sun for two days, and bruised in a mill to break up the seed, which is then freed from the testa. The cotyledons are after this process called "dhal," which is commonly used in making the vegetable curry of the Hindu, or ground into flour which is made into sweet cakes.

The seed is said to be easily digested, and therefore suitable for invalids, but it is regarded as apt to produce costiveness. It also disagrees with some people, causing acidity and heartburn. A poultice made with the seeds is said to check swellings. The leaves are used in diseases of the mouth; the tender leaves are chewed in cases of aphthae and spongy gums.

The generic name *Cajan* is derived from the Malayan name for the plant, which is "katjang."

The plant is at present cultivated and escaped throughout the warm regions of the world, but rarely used as a food by any but black and

brown races. Its native country is lost in antiquity; but its cultivation outside of Africa, India, and Malaya is quite historic; it was introduced from Africa into the West Indies, and has been carried by natives from there to Florida. The majority of Indian botanists do not believe it native of India, while DeCandolle regards it as native of tropical Africa, and introduced perhaps three thousand years ago into India.

The pigeon-pea, or congo-pea is a shrubby herb growing up to five or six feet high in cultivation, but in the tropics becoming a bushy shrub. The stem is softly silky pubescent on the ridges. The leaves are pinnately trifoliolate, light green and glabrous above, silvery pubescent beneath, the individual leaflets being two to four inches long, oblanceolate and acute, the terminal one the largest. The petiole is sharply angled, about two inches long, the stipules ovate, acuminate, and very small. Each leaflet has two bristles at the base of its petiolule. The stipules become first swollen at the base, and then decurrent into sharp pubescent ridges, extending far down the stem, giving it a striped appearance. The flowers terminate the main stem or its branches, in loosely branched panicles, the glandular-pubescent branchlets of which have the numerous flowers compactly racemed at their tips, each flower subtended by an ovate, early deciduous scale. The flowers are three fourths of an inch to an inch long, bright yellow. The calyx is glandular pubescent, two-lipped, the two lobes of the upper lip connate, the middle lobe of the lower lip longer than the two lateral lobes. The standard is curved back horizontally above the claw, the blade orbicular with two tubercles at the base extending into sharp auricles beneath, nearly as long as the short claw. The wings are somewhat elliptic, clawed and auricled. The keel petals are joined only at the angle of curvature, they also are bluntly auricled. The androecium consists of ten stamens, nine of which are fused into a transparent tube, with their filaments free only for the upper fourth of their length, and alternately long and short; the filament of the tenth stamen is entirely free. The anthers are small and yellow. The ovary is pubescent. The style is the same length as the filaments, inside of the tube of which it is included, slightly swollen at its point of upward curvature. The stigma is capitate. The fruit is a curved legume, narrow or broad, and green or streaked with purple, according to variety; containing from one to six nearly circular, pea-like, brownish seeds and covered on the outside with a copious glandular pubescence, whose glands, as elsewhere on the plant secrete an aromatic fluid.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Inflorescence. Fig. 2.—Calyx, × 2. Fig. 3.—Standard. Fig. 4.—A wing-petal. Fig. 5.—A keel-petal. Figs. 6, 7.—Androecium, × 2. Fig. 8.—Gynoecium, × 2. Fig. 9.—Legume. Fig. 10.—Seed.

NOTHOSCORDIUM FRAGRANS

(Plate 433)

NOTHOSCORDIUM FRAGRANS

Fragrant false-onion

Native of Africa and cultivated

Family ALLIACEAE — ONION Family

Allium fragrans Vent. Descr. Pl. Cels *pl. 26.* 1801.
Nothoscordium fragrans Kunth, Enum. 4: 461. 1843.

If one meets with a fragrance of vanilla near gardens of the coastwise cities of our South Atlantic and Gulf states in May, it is likely to be traced to a plant known as the fragrant false-onion. This plant is cultivated scattered in lawns, in narrow beds along fences and hedges, and in borders. It is very vigorous, and once established not only maintains itself, but spreads rapidly, chiefly through the production of numerous bulblets, as shown in the accompanying illustration; these can be gathered from the soil by the handful where the plant grows plentifully. The umbels are normally many-flowered, and the succession of flowers gives rather a long blooming-period. In addition it is quite foliaceous as well as floriferous. As interesting as this monocot is from the horticultural aspect, which accounts for its spreading to many parts of the world, its history is more interesting, even romantic. The nativity of the plant has always been uncertain, until our explorations in the southern states seem to have solved the problem. It was cultivated in the "Jardin de J. M. Cels" and in the "Jardin des Plantes," Paris, at the beginning of the last century. When it was published, by Ventenat, in 1801, with a description and a plate, it was recorded that Cels thought the original specimen came from Africa. Soon afterwards records appear stating that it occurred in Virginia, Carolina, Mexico, Africa, Mauritius, with varieties in Jamaica and Nepal, but doubtless the plants cited from most of these countries came from those originally cultivated in France, and no one seems to have committed himself as to its nativity. Nothing seems to have occurred in the United States to bring the plant to botanical prominence, until it was collected about Charleston, South Carolina, in 1912. Several years ago the writer received a letter from a former resident of Carabelle, Florida, in which the following paragraph occurred: "At that time (1896-'97) and for some years previously ships had come there in ballast from Africa to load with lumber at the large mills then operating at Carabelle. They had discharged this ballast of African

rock and soil at Dog Island, and many queer African growths appeared and flourished there . . . . . a talk with the older settlers would inform you, and it might be worth your while to go over to the old ballast dumps and look around.''

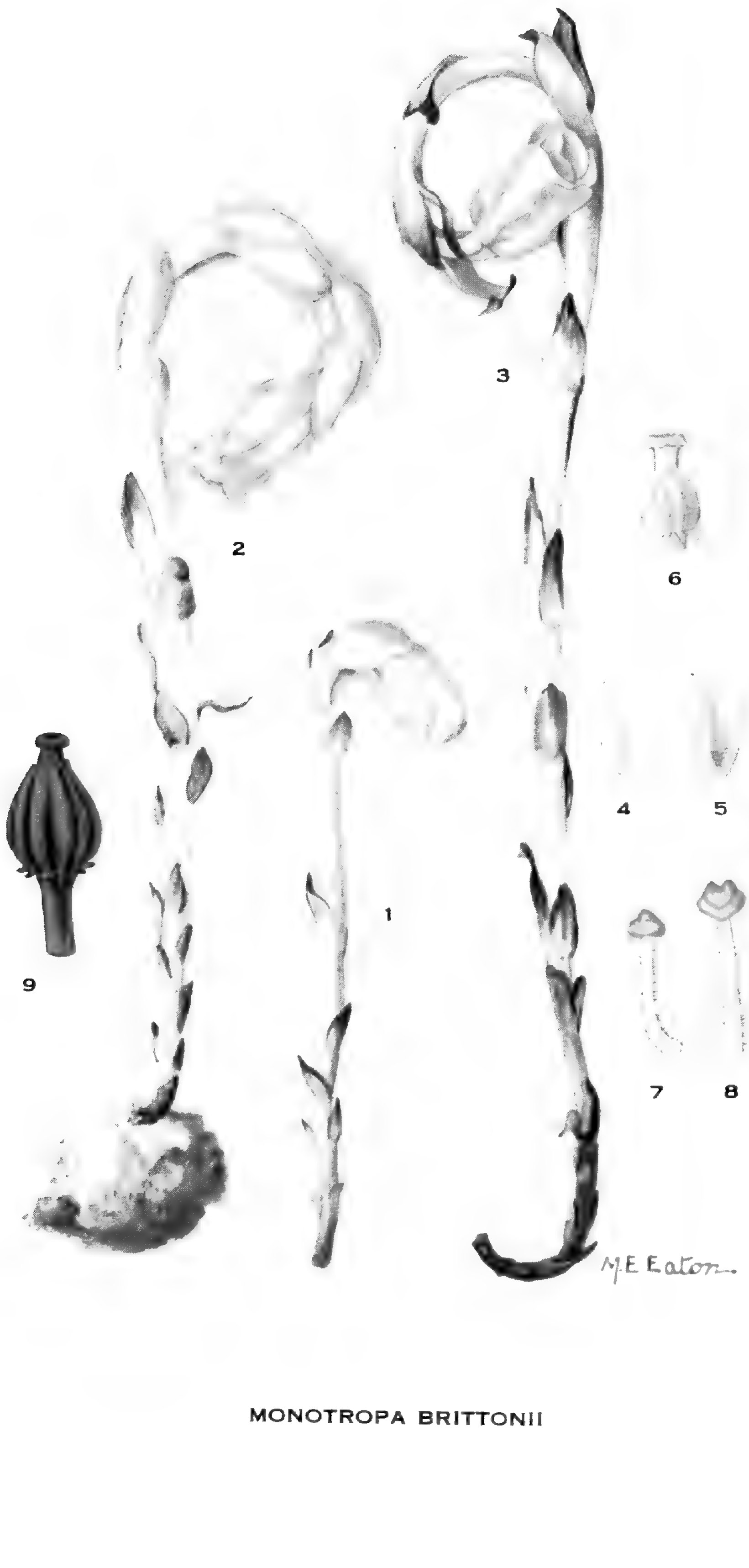
It was several years before an opportunity came to examine the plant growth on Dog Island. When we did manage to visit the island we found that it had been swept nearly clean of vegetation many years earlier (1899) by a hurricane. However, in the ballast material from Africa, referred to above, we found among other remnants some bulbs and also quantities of bulblets; these were imbedded in the clay and sand among the rocks and had survived the washing and wearing effects of the hurricane. It was winter and nothing was in flower. Bulbs were at once sent to the Garden where they flowered in the spring as fine specimens of *Nothoscordium fragrans*.

The generic name, *Nothoscordium*, is from the Greek meaning false-garlic, referring to the odorless bulb and other foliage of the plant.

The fragrant false-onion has a brown ovoid bulb an inch long, with a short neck, with numerous coarse white roots at the base and producing a ring of white bulblets around the base above the roots. The 5-7 leaves are basal; the blades are narrowly linear, mainly four to fifteen inches long, up to one fourth of an inch wide, nearly flat, pale green and glaucous, acute or acutish, smooth, more or less spreading. The scape is erect, eight to eighteen inches tall, terete, glabrous, colored like the leaves. The involucre is scarious, inequilateral and oblique, glabrous, the bracts striate. The umbel is erect, 8-20-flowered; the slender pedicels, colored like the scape, are glabrous, half to three quarters of an inch long in anthesis, elongating as the fruit matures to an inch and a quarter to an inch and three quarters. The sepals are up to a half inch long, with a green-and-brown streaked claw and an elliptic blade with a magenta midvein without, otherwise white. The petals are nearly similar to the sepals, but with the blade ovate and without the colored midvein, and more obtuse. The six stamens are shorter than the sepals and petals; the filaments are much flattened, narrowly linear-lanceolate, yellow below, white above. The anthers are yellow, ovoid, notched at the base. The ovary is green, obovoid, about one sixth of an inch long, green, obscurely 3-lobed. The style is columnar, obscurely 3-angled, yellow-green at the base, white above. The stigma is minute, obscurely 3-lobed. The capsule is obovoid, about one third of an inch long, dark green, bluntly 3-lobed at the apex, often tipped with the persistent style.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Bulb, with a ring of bulblets. Fig. 2.—Tip of a leaf. Fig. 3.—Cross section of leaf, × 3. Fig. 4.—Top of scape with inflorescence. Fig. 5.—A sepal and a petal, with accompanying stamens, × 2. Fig. 6.—Gynoecium, × 2. Fig. 7.—Top of scape, with fruit.



MONOTROPA BRITTONII

(Plate 434)

MONOTROPA BRITTONII

Britton's Indian-pipe

Native of peninsular Florida

Family MONOTROPACEAE INDIAN-PIPE Family

Monotropa Brittonii Small, Jour. N. Y. Bot. Gard. **28**: 7. *f.* 2. 1927.

To one used to finding the common ghostly white Indian-pipe (*Monotropa uniflora*) in the rich northern broad-leaved forest, the discovery of colonies of a yellow-green tinted species in the sand of the Florida scrub was a surprise. In addition to its coloring and habitat the fact that it flowers and fruits throughout the year instead of during the short summer season of its northern relatives, distinguishes it. In fact, winter is the main flowering season. In spite of its barren habitat, Britton's Indian-pipe is a more vigorous grower than its northern relative. In the colony discovered in 1919 on the Florida coast north of Pompano, each ghost-like stem bore an ochroleucous bud or a flower, either erect, horizontal, or nodding, or even curved around, the stems later becoming nearly a foot and a half tall. This indicates the probability of mycorrhiza and symbiosis as beneficial factors in acquiring nutriment. Since its discovery this Indian-pipe has been found in various places as far north as the mouth of the Sebastian River or about half way up the eastern coast of Florida. It is always found in the scrub, associated with the Florida rosemary (*Ceratiola ericoides*), the scrub prickly-pear (*Opuntia ammophila*), the false-rosemary (*Conradina grandiflora*), and the knot-plume (*Thysanella robusta*).

At the original locality it was found with scrub-oaks, heaths, spruce-pine, and saw palmetto. There the tropical red-brown butterfly-orchid or cowhorn-orchid (*Cyrtopodium punctatum*) grows on the cabbage-trees (*Sabal*), and three species of the northern reindeer-moss (*Cladonia*) carpet the sandy floor. Through this white carpet of lichens, the Indian-pipe pushes up in colonies of various sizes. The effect of the lichen covering is that of large areas of sand covered with a thin blanket of snow.

The generic name, *Monotropa*, is composed of two Greek words meaning one-turn and referring to the inclined or nodding flower.

A synopsis of the chief diagnostic characters in addition to the color differences, of the Floridian and more northern plants follows:

Plant up to 12 inches tall: cauline leaves (scales) ovate to lanceolate, somewhat pointed: sepals and petals entire or somewhat eroded at the tip, glabrous or nearly so, fitting closely together or overlapping at the strongly auricled base: filaments slightly pubescent with short hairs: lobes of the disk sharply pointed, projecting downward. *M. uniflora.*

Plant up to 18 inches tall, in fruit stouter throughout than *M. uniflora*: cauline leaves (scales) spatulate on the lower part of the stem, oblanceolate to ovate above, blunt or rounded: sepals and petals more or less serrate, pubescent within on the lower part and on the edges, separated near the base which is scarcely auricled, thus exposing the filaments: filaments copiously pubescent with long hairs: lobes of the disk blunt, projecting straight out or upward. *M. Brittonii.*

Britton's Indian-pipe grows singly or in dense colonies. The stems are stoutish, mostly four to ten inches tall in flower, up to eighteen inches in fruit, tinged with yellow, especially above, nodding or curled around at the tip. The leaves (scales) are colored like the stem at their bases, ovate near the base of the stem to lanceolate above, often somewhat pointed, becoming dark at the tip. The flower is solitary, nodding, ochroleucous or salmon-colored, on a very short and stout pedicel. The sepals are cuneate-spatulate to elliptic, half to three quarters of an inch long. The petals are about as long as the sepals or slightly longer, cuneate to cuneate-flabellate, saccate at the base, glabrous without, sparingly or rather copiously pubescent within, copiously ciliate on the edges except near the tip, broadly truncate and often slightly undulate at the apex. The stamens fit closely along the ovary. The filaments are linear-filiform, copiously long-pubescent. The anthers are white, glabrous. The ovary is ovoid, seated in a disk with ten subulate blunt lobes which project outward or upward, with five plate-like ribs, each of which is two-lobed at the apex where they meet the style. The stout style is more or less decidedly turbinate or nearly cylindric. The stigma is discoid, slightly rounded. The capsule is erect, ovoid or ellipsoid-ovoid, about three quarters of an inch long.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Plant in bud. Figs. 2, 3.—Two plants in flower. Fig. 4.— Sepal. Fig. 5.—Petal. Fig. 6.—Gynoecium. Figs. 7, 8.—Two stamens, × 2. Fig. 9.—Capsule.

GELSEMIUM RANKINII

(Plate 435)

GELSEMIUM RANKINII

Odorless Yellow-jessamine

Native of coastal southeastern United States

Family LOGANIACEAE — LOGANIA Family

Gelsemium Rankinii Small, sp. nov.

The ranks of the "monotypic genera" have recently not held their own. North Carolina alone has been the scene of the fall of two of these well-known cases. First the popular "pyxie" (*Pyxidanthera barbulata*) received a specific associate, and after that the yellow-jessamine followed suit, and a new species of *Gelsemium* came to light.

No plant is better known and scarcely any one more popular in our southeastern States than the yellow-jessamine. Its garlands, festoons, and cascades of gold emphasized against a background of the greenery of its natural arbors escape no eye. For many generations this popular plant, one of the ubiquitous harbingers of spring was just "yellow-jessamine." As has been recorded in reference to this fact:

"Queen Jessamine in her forest shades
Unwinds her tresses golden;
Though blust'ring March hath not begun
To whiten waves or willows,
Whilst April Showers that woo the sun
Still sleep on cloudy pillows."

Although a second American species of *Gelsemium** has been vaguely indicated for many years by herbarium specimens, little did those who adored the yellow-jessamine in its native haunts suspect that it was twin. Not until the observations of a naturalist, H. A. Rankin, of Hallsboro, North Carolina, in 1927 and 1928, was this condition proved without a doubt. Mr. Rankin wrote: "I am again troubling you with my Waccamaw River variety of *Gelsemium*—am sending you some material today by parcel-post. One container has sprays of the typical form in full bloom, while the other has the Waccamaw River kind, but with no buds open yet." "On March 19th I saw a few scattered flowers of the typical form. Now they are a little past their prime, so I went to the river hoping to find the others in bloom, but could not find even one bud open. The difference in blooming season this year will be more than twenty days."

The name *Gelsemium* is derived from "gelsomino," an Italian name of the old-world jasmine or jessamine, of the olive family.

* It is true, the Asiatic genus *Leptopteris* Blume is sometimes included in *Gelsemium*.

The odorless yellow-jessamine is a vine like *G. sempervirens*, with the old bark brown, the bark of the twigs green, glabrous throughout. The leaves are opposite, persistent, the blades lanceolate to ovate, half to two and three quarters inches long, acute or acuminate, entire, deep green above, pale green and finely veined beneath, rounded at the base, short-petioled. The flower-clusters are axillary, short-stalked, 2-4-flowered, or sometimes 1-flowered. The pedicels are stout, enlarged upward, scaly at the base, naked above, the flowers are dimorphous, not fragrant. The calyx is green, appressed to the corolla-tube, the lobes lanceolate, one sixth inch long, acuminate, glabrous, usually dark-tipped. The corolla is deep-yellow (the bud acute or acutish, fluted), short trumpet-shaped, the tube rather abruptly dilated when the corolla is open, three quarters of an inch to an inch long. The limb is an inch to an inch and a quarter wide, spreading, the lobes ovate, scarcely a third of an inch long, varying from minutely pointed to minutely notched. The five stamens are included, erect; the filaments are partly adnate to the corolla-tube, with the free parts subulate, yellowish-green, glabrous. The anthers are lanceolate, about one sixth of an inch long, the basal lobes rather acute. The ovary is sessile in a slightly lobed disk, conic, green, slightly flattened, tapering into the style. The style is filiform, or subulate-filiform in the short-styled flowers, green, very slightly enlarged under the stigmas. The four stigmas are clavate, green, obtuse. The capsule is brown, with the body elliptic, a half an inch long or nearly so, long-beaked, veinless. The seeds are several, wingless with the edges more or less erose-crenulate.

The above description was made from specimens from the swamps of the Waccamaw River near Hallsboro, North Carolina, collected by H. A. Rankin, April 17, 1928. This plant also occurs in Georgia, northern Florida, and Alabama.

The following synopsis will indicate the difference between the two species of *Gelsemium* in the southeastern states:

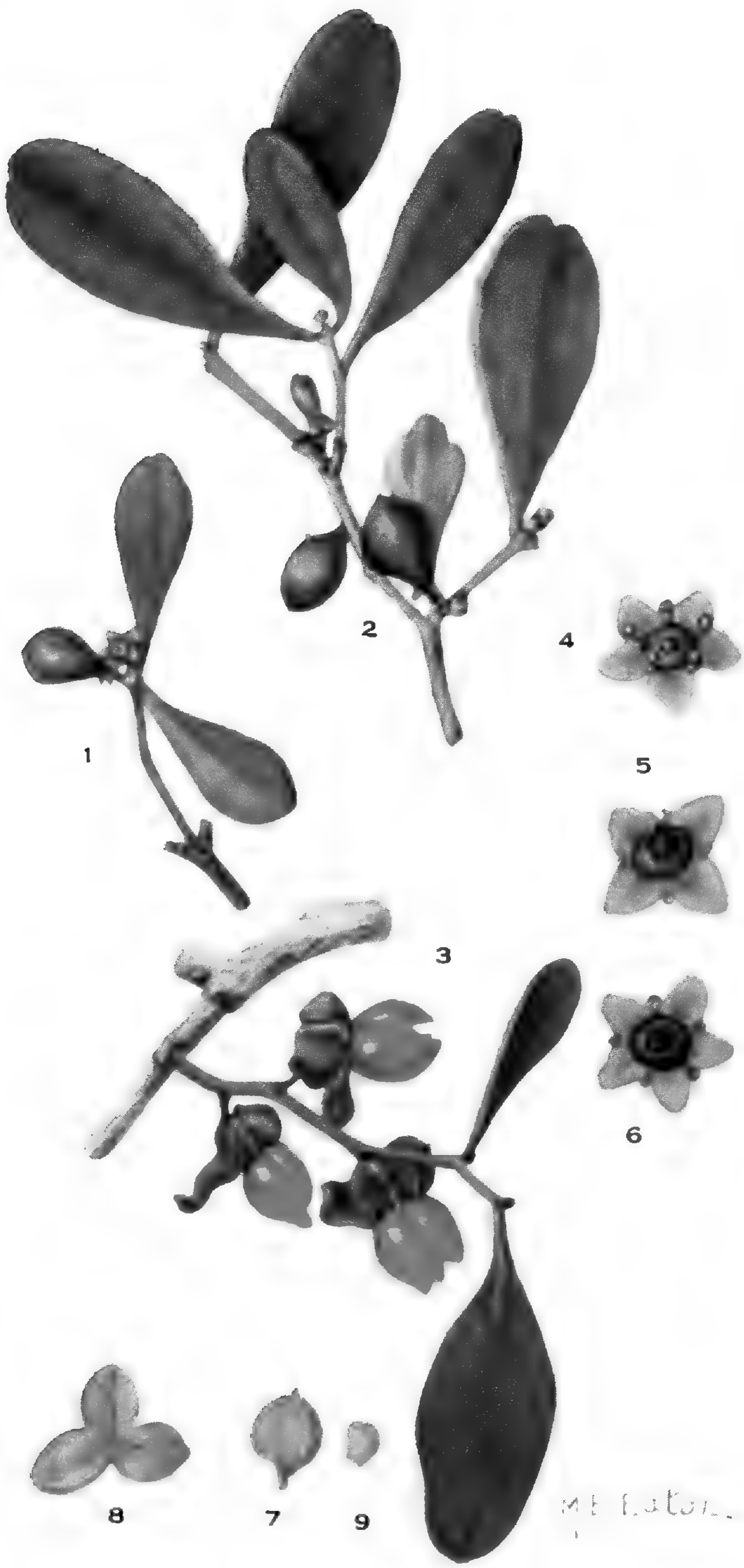
Leaf-blades narrowed at the base: pedicels scaly throughout: calyx-lobes elliptic to ovate-elliptic, obtuse: corolla-tube gradually dilated: anthers elliptic-ovate: capsule-body narrowly oblong, veiny, three quarters of an inch to nearly an inch long, short-beaked: seed about a third of an inch long. *G. sempervirens.*

Leaf-blades rounded at the base: pedicels scaly at the base, naked above: calyx-lobes lanceolate, acuminate: corolla-tube abruptly dilated: anthers lanceolate: capsule-body elliptic, veinless, a half inch long or nearly so, long-beaked: seed about a sixth of an inch long. *G. Rankinii.*

Mr. Rankin writes further that this form [*G. Rankinii*] is just as abundant in places in the swamp as the typical form is on higher ground, and while he could not find an open flower on April 6th, the other form [*G. sempervirens*] was in full bloom and covered the undergrowth not fifty yards away.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Tip of a flowering branch. Fig. 2.—Sepal, × 4. Fig. 3.—Corolla, laid open. Figs. 4, 5.—Two stamens, long and short, × 2. Figs. 6, 7.—Two pistils, long and short, with the calyx attached to the short one, × 2. Fig. 8.—Capsule.



MAYTENUS PHYLLANTHOIDES

(Plate 436)

MAYTENUS PHYLLANTHOIDES

Northern Mayten

Native of Florida, Texas, and northern Mexico

Family CELASTRACEAE STAFF-TREE Family

Maytenus phyllanthoides Benth. Bot. Voy. Sulph. 54. 1844.

The region bordering on the Gulf of Mexico, in particular Florida on the east and Texas on the west, represents an apparently critical latitude in the case of certain South American and West Indian genera. *Maytenus* is a case where a single species out of a total of seventy in that genus, mostly South American, reaches the Gulf coast of the United States. While not a rare plant, *Maytenus* is not ubiquitous as are some of its associates within the same range.

It occurs in two forms apparently dependent upon habitat. On the rocky shores of the Florida Keys it grows as a scrubby shrub about head-high with rigid stems and brushy branches. On the sand-dunes and Indian mounds of some of the Keys and on islands farther north it grows as a tree up to twenty feet tall.

In general the various associated plants are of the same stature as *Maytenus* and are often unusual. Joewood—*Jacquinea keyensis*—often forms large thickets in company with *Maytenus*, intimately intermixed, and such thickets are conspicuous with the flower-clusters of joewood and fruit of maytens. The flowers of joewood in addition are very fragrant while those of mayten are not.

On some of the Florida keys mayten is associated with the tree-cactus *Cephalocereus* (both *C. keyensis* and *C. Deeringii*). The fruit of the tree-cactus resembles that of mayten in its method of opening but of course it is built on a much larger scale. On ripening, this berry-like capsule bursts and recurves its walls thus exposing the numerous very small black seeds imbedded in a mass of red arillaceous material, and ready for dissemination.

Little is recorded about the early history of this interesting plant. It was discovered on the voyage of the exploring ship "Sulphur" about 1840. In connection with the original description of the species all the geography we find is "Bay of Magdalena," Lower California. It is strange that this plant evaded collectors in Florida until long after it was discovered away over in Lower California, for by 1840 the majority of the tropical species of shrubs and trees had been discovered in Antillean Florida. Many more years passed be-

fore it could definitely claim a place in the West Indian flora, for it was not until 1909 that specimens were discovered on the Keys off the northern coast of Cuba.

Of no practical use now, *Maytenus phyllanthoides* may some day become an economic plant, for Thomas A. Edison has recently discovered that the leaves contain nearly one and a half per cent of gutta-percha.

The generic name *Maytenus* is the latinized form of "mayten," a Chilean name for one of the South American species.

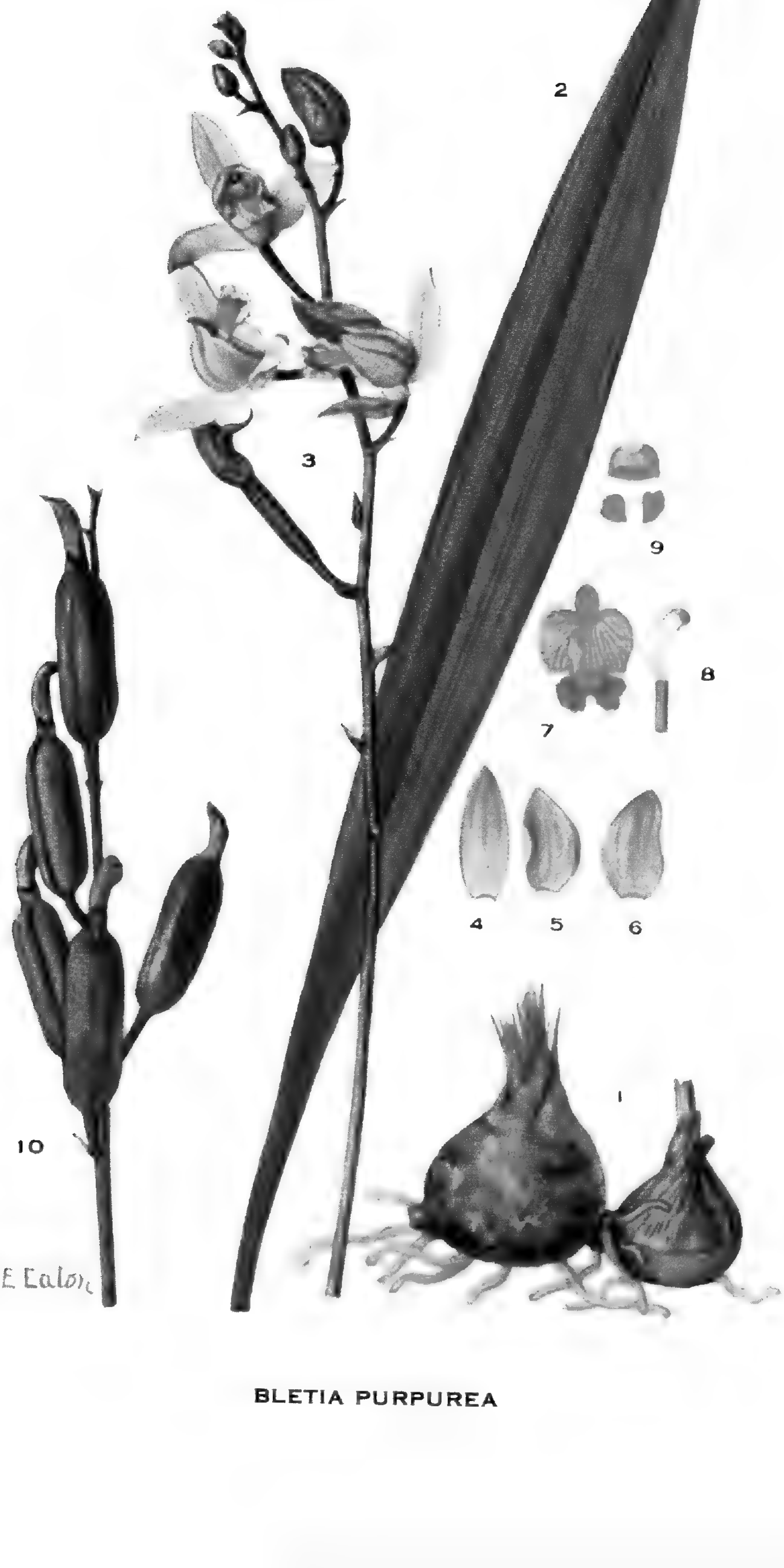
The northern mayten is a shrub or small tree with an erect or inclining trunk. The branchlets are gray, slightly roughened, and very brittle. The twigs are green, glabrous, and slightly zigzag. The leaves are rather numerous, alternate, firm-fleshy, very brittle, evergreen, the blades spatulate, obovate, somewhat cuneate, or elliptic-obovate, three quarters of an inch to an inch and a half long, obtuse or emarginate at the thick, blunt-edged, undulate tip, bright-green, glabrous, shining, narrowed into short petiole-like bases, with the venation inconspicuous, but the midrib and lateral veins more evident on the upper surface than on the lower. The polygamo-dioecious flowers are solitary or few together in inconspicuous clusters, short-stalked, green. The hypanthium is depressed-turbinate, bright green. The calyx is minute, the sepals 4, 5, or 6, deltoid or ovate-deltoid, obtuse or acutish. The corolla is rotate, about one fifth of an inch wide, the lobes are 4, 5, or 6, ovate to deltoid-ovate, obtuse or rounded at the apex, minutely roughened on the edge. The disk is circular or slightly angled, green, often darker on the edges. The stamens are 4, 5, or 6, much shorter than the corolla-lobes, erect or slightly spreading, the filaments subulate, very short, the anthers didymous, minute. The ovary is conic, sessile and immersed in the disk at the base. The sessile stigmas are 3 or sometimes 2 or 4. The capsule is obovoid, sometimes pyriform or oval, one third to half an inch long, 2-or 3-celled, loculicidal, 2- or 3-valved, the valves reflexed exposing the scarlet arils of the seeds. The seeds are yellowish or brownish, oval or ellipsoid, one fifth to one fourth of an inch long.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Flowering branch. Fig. 2.—Branch with unopened capsules. Fig. 3.—Branch with opened capsules, showing the red arils of the of the seeds. Fig. 4.—Staminate flower. Figs. 5, 6.—Pistillate flowers. Fig. 7.—One form of capsule, brown or yellowish. Fig. 8.—The same in dehiscence. Fig. 9.—Seed with aril removed.

PLATE 437

ADDISONIA



BLETIA PURPUREA

(Plate 437)

BLETIA PURPUREA

Pine-pink

Native of Florida and the West Indies

Family ORCHIDACEAE — ORCHID Family

Limodorum purpureum Lam. Encyc. **3**: 515. 1789.
Limodorum verecundum Salisb. Prodr. 9. 1796.
Bletia verecunda R. Br. in Ait. Hort. Kew. ed. 2. **5**: 206. 1813.
Bletia purpurea DC. Mém. Soc. Genève **9**: 100. 1841.

The very restricted area comprising the Everglade Keys, in southern peninsular Florida, boasts of more than forty species of orchids. According to habitat their distribution is in the proportion of about eight in the pinelands, eight in the swamps and the marshes, and twenty-four in the hammocks. The hammock-inhabiting species are on the whole the more showy, some having numerous, highly-colored flowers; fourteen of them are epiphytic, growing on trees.

The pine-pink is a pineland inhabitant, the most showy of this category and the tallest, with the exception of the rarer kite-orchid —*Triorchos ecristatus*. It is very unevenly distributed. Sometimes only an isolated plant may be found; at other times, especially after the pine-woods have been swept by fire, the flowering stems are scattered over large areas, and thousands of plants may be seen in colonies of one or two dozen stems, growing about three feet tall and bearing numerous rose-pink flowers with their elegantly variegated lips. This orchid grows best in the honeycombed surface of the oölitic limestone of the Everglade Keys; there its corms often fit so snugly in the rounded cavities of the small erosion holes that they must be chopped out with an ax in order to secure them.

Although ordinarily a pineland plant, in the Big Cypress Swamp it occurs on the stumps and trunks of the cypress trees, at about the high-water mark, and has curiously modified flowers. The normally gorgeous lip of the perianth is usually similar to the two lateral petals and the other parts are much reduced. The perianth seldom expands; the cleistogamous flowers are remarkably prolific in producing fruits. This pseudo-epiphytic condition may result from subsidence of the land. If the surface of the Big Cypress Swamp were a few feet higher it would be pineland instead of cypress swamp, and there is evidence that this condition existed in rather recent geologic time. Thus we can imagine the pine-pinks, as the land gradually subsided, betaking themselves to the cypress trunks and knees, and gradually climbing higher and higher as the waters rose,

establishing themselves by degrees just at or above the high-water level. The generally changed conditions perhaps deprived the flowers of the usual insect or insects that pollinated them, so the flowers ceased producing a showy perianth, dispensed with insect-pollination, and reduced themselves to the cleistogamous state.

The early history of this orchid is brief and without detail. Lamarck, in publishing *Limodorum purpureum*, merely records that it grew in the Antilles and warm America. It was first found in Florida about 1840 by J. L. Blodgett, on Big Pine Key.

The generic name, *Bletia*, commemorates the name of Luis Blet, a Spanish apothecary.

The pine-pink is gregarious as a result of the chains of globose-ovoid corms, mostly one to two inches in diameter, giving off coarse-fibrous roots from the base. The erect leaves arise from a bud on the corm, usually several together, the outer ones shorter, from six inches long and about half an inch wide to three feet long and an inch or two wide. They are closely folded around each other at the base. The bright green blades, entire and tapering to base and apex, have mostly five to seven primary rib-like veins and many intervening secondary and tertiary ones. The flower-stem arises from a bud on the corm, either close to the leaf-bud or remote from it. It is erect or nearly so, virgate, wiry, simple or with few virgate branches above in the case of very robust plants; its few nodes are rather inconspicuous, but they are furnished with appressed acute ribbed partly clasping scales. The bracts of the inflorescence are stiff, spreading, broad at the base, acute or slender-tipped. The flower-buds are obliquely ovoid, acute. The flowers are usually several, sometimes solitary, sometimes numerous, ascending, showy. The hypanthium is elongate, glabrous, becoming clavate. The perianth is mainly rose-purple or rose-pink, or very rarely white. The median sepal is elliptic or elliptic-lanceolate, three quarters of an inch long or more, acute; the lateral sepals are decidedly obliquely ovate, shorter than the median one, obtuse or acutish at the apex, often turgid and yellow at the base, more or less spreading. The lateral petals are ovate, less oblique than the lateral sepals, but of about the same length, concave, erect or nearly so, acutish. The varicolored lip is about a half inch long; the broad lateral lobes and the crested body are yellowish and lined with reddish brown; the middle terminal lobe sessile or short-stalked, deeply notched at the apex, broader than long, deep pink, somewhat crisped. The column is somewhat clavate, mainly white. The anther is hemispheric, yellowish or pink-tinged at the rounded top. The eight pollen-masses are yellow. The capsules are erect, cylindric, an inch or more long, deep green or brown when dead-ripe, rather prominently three-ribbed, short-stalked, and stout-beaked.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Two bulb-like corms. Fig. 2.—Small leaf. Fig. 3.—Top of a flowering stem. Fig. 4.—Median sepal. Fig. 5.—Lateral petal. Fig. 6.—Lateral sepal. Fig. 7.—Lip. Fig. 8.—Column. Fig. 9.—Anther and two pollinia, × 4. Fig. 10.—Top of the stem with capsules.

IPOMOEA MACRORHIZA

(Plate 438)

IPOMOEA MACRORHIZA

Midden Morning-glory

Native of coastal southeastern United States

Family CONVOLVULACEAE MORNING-GLORY Family

Ipomoea macrorhiza Michx. Fl. Bor. Am. 1: 141. 1803.
Convolvulus macrorhizus Ell. Bot. S. C. & Ga. 1: 253. 1817.

The esthetic interest of some of the prehistoric American aborigenes is evident in the beauty as well as usefulness of plants found on Indian village sites and kitchenmiddens. Early post-Columbian records of the white man and the present floristics of former habitats of Indians indicate the use of such decorative plants as coontie (*Zamia*), a cycad, and the china-briar (*Smilax*), whose underground stems or root-stocks were the source of starch; while in the case of the tunas or prickly-pears (*Opuntia*) and the palms (*Sabal*, *Serenoa*), the fruits were eaten.

The midden morning-glory or aboriginal-potato is another plant now found on sites of aboriginal habitations. It is a relative of the sweet potato (*Ipomoea Batatas*), but even a closer relative of the Mexican *Ipomoea Jalapa*. Whether it is a descendant of plants introduced from Mexico during one of the aboriginal migrations is not known. This midden morning-glory was a plentiful source of starch to the Indians. Roots weighing fifty to a hundred pounds have often been found among the oyster shells of kitchenmiddens and in the sand of hammocks. As a seedling grows its roots exert tremendous pressure and result in the production of globose cavities in the mass of oyster and clam shells packed for ages.

The plant is a vigorous vine with broad gray-green leaves and showy flowers as indicated in the accompanying plate. It often blooms in the evening, the flowers expanding in late afternoon, and fading during the night; by morning the corollas are well shriveled. The capsules that follow the flowers are hidden in the slightly accrescent calyx and persist for many months. When the seeds are discharged they are completely hidden in a coat of silky brown hairs with black tips, which help in their dissemination by the wind.

Early in the nineteenth century the plant was confused with the true Jalap (*Ipomoea Jalapa*), and therefore the fact that its roots were used as food gave rise to investigation as is recorded by Stephen Elliott in 1817. Referring to *I. macrorhiza*, Elliott records:—

"This has been generally considered by modern botanists as the *C.* [*Convolvulus*] *Jalapa* of Linnaeus; but while the external characters of the two plants appear in many respects to agree, the medi-

cal qualities of this by no means resembles those of the officinal Jalap. We must therefore conclude either that modern botanists have mistaken the plant of Linnaeus, or that climate has totally changed or destroyed its active properties; or, what is equally probable, that the plant producing the officinal Jalap has been concealed by the jealous vigilance of the Indigenes from the curiosity of Europeans.''

The generic name, *Ipomoea*, is said to be composed of two Greek words signifying bindweed used in reference to the similar habit of morning-glories and bindweeds.

The aboriginal-potato is a vigorous firm-herbaceous perennial vine, with large roots, which are globose or more or less irregular from pressure. The stem and branches are widely twining, softly fine-pubescent, reddish, and leafy throughout. The leaves are numerous; the blades vary from deltoid to reniform, three to five inches long, irregularly toothed and sometimes three-lobed, deep green and glabrous or nearly so and with impressed veins above, copiously gray- or whitish-tomentose beneath, truncate or subcordate at the base, on slender pubescent petioles. The flowers are solitary in the leaf-axils or two to five together. The flower-stalks are jointed at or near the middle; the peduncle reddish; the pedicel green, enlarged under the calyx, ultimately ridged. The calyx is closely appressed to the base of the corolla-tube, finely, closely, and softly pubescent. The sepals are one half to three quarters of an inch long, rounded or emarginate at the apex, or acutish by the inrolled margins, the outer ones ovate, often purple-tinged, the inner ones slightly longer and more coarsely pubescent than the outer, oval or oval-ovate when flattened out, all persistent. The corolla is three to four inches long; the tube is pinkish without, deep purple within, the limb three to three and a half inches wide, pale pink-purple except the throat, which shades into the bright magenta of the tube, with a wide notch at the tip of each of the five plates, each broad rounded lobe notched at the middle and also with a slight notch in each secondary lobe. The stamens are included. The filaments are slender, the free parts an inch and a quarter to an inch and a half long, alternately long and short, white, magenta-tinged and with magenta glandular hairs at the point of union with the corolla-tube. The anthers are lanceolate, about a quarter of an inch long, cream-colored. The ovary, seated in an annular receptacle or disk, tapers into the filiform, white or greenish, glabrous style. The stigma is capitate, pale cream-colored. The capsule is oval to subglobose, varying to slightly broadest above the middle or below it, one half to three quarters of an inch long, glabrous, surrounded by the slightly accrescent persistent calyx. The seeds are four in a capsule, covered with long brown spreading or ascending hairs.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Piece of stem with a flower and a bud. Fig. 2.—Part of flower with the corolla removed, showing an outer and an inner sepal and the gynoecium. Fig. 3.—Piece of corolla-tube showing the attachment of the stamens. Fig. 4.—Capsule seated in the calyx. Fig. 5.—Seed.

PLATYPUS ALTUS

(Plate 439)

PLATYPUS ALTUS

Scoop-orchid

Native of southern Florida and tropical America

Family ORCHIDACEAE — ORCHID Family

Limodorum altum L. Syst. Nat. ed. 12. 2: 594. 1767.
Cyrtopodium Woodfordii Sims, Bot. Mag. under *pl. 1814.* 1816.
Cyrtopera Woodfordii Lindl. Gen. & Sp. Orch. Pl. 180. 1833.
Platypus papilliferus Small & Nash; Small, Fl. SE. U. S. 329. 1903.
Platypus altus Small, Fl. SE. U. S. ed. 2. 329. 1913.

To meet with a terrestrial orchid among our native plants taller than one's head is, to say the least, an unusual occurrence. However, this is likely to happen in traveling in the Big Cypress Swamp of southern Florida. The same plant in the Everglades and in other localities on the edge of its geographic range usually grows only knee-high or waist-high. Like many of our terrestrial orchids, particularly of the humus-lovers, the scoop-orchid has large subterranean storage reservoirs—pale potato-like organs as large as one's fist or smaller, which build up one after the other from season to season. These are enabled to develop and mature by the aid of long plaited leaves which resemble the seed-leaves of some palms, with the cooperation of a friendly fungus that lives in association with the subterranean parts of the plant. At an appointed time, usually as the leaf withers, a bud starts to grow at the end of a corm and develops into an erect stem which bears fleshy scales (leaves) on the lower part and flowers above. The flowers, borne on stout spreading stalks, are, on the whole, rather dull, but yet conspicuous, mainly of a reddish or brownish color more or less variegated with pink and purple. The flowering period is not by any means strictly seasonal according to the calendar, for it is largely governed by temperature and moisture favorable or unfavorable to the growth of an associated friendly fungus. Thus, the plant does not flower through its range at any given season, but it may be found in flower locally, at almost any time of the year.

In the United States this orchid is confined to southern Florida, occurring on both sides of the peninsula as far north as Halpatiokee River south of Fort Pierce. It always grows in a turf, not far above the water-table, which, sometimes several times a year, rises and floods the region. It is moisture-loving, and if removed to regions north of peninsular Florida it may be successfully grown under glass if kept sufficiently moist. The accompanying figure was made from plants collected in the Everglades near Royal Palm hammock, Dade County, Florida, and grown under glass at the New York Botanical Garden. Outside of Florida the scoop-orchid

occurs in the West Indies and in tropical continental America. It is said to occur also in Africa. In some places it is known as wild-coco or ground-coco.

This orchid has had a varied generic history. Since its discovery it has been associated with not less than five genera, in none of which did it belong.

The generic name, *Platypus*, is a combination of two Greek words meaning broad-foot and referring to the wide downward prolongation of the column, technically called the foot.

The scoop-orchid has a fist-like corm which is white, or green when exposed to the light, giving out coarse fibrous roots. The leaves, three to six in a cluster, arise from the corm, with their bases involutely imbricate into a column-like neck which supports the blades. The blades are linear and attenuate at both ends, one to four feet long, plicate, with usually nine primary ribs, deep green, glabrous, channeled at the base. The flowering stem, arising beside the leaf-cluster and bound to it at the base by the basal sheath of the leaf-cluster, is simple, ultimately about as tall as the leaves or taller, nearly or quite clothed with sheathing scales, which are oblique at the top. The raceme is several-flowered, the flowers separated. The flower-stalks (pedicels and hypanthia) are spreading, one third of an inch to an inch and a quarter long, subtended by deciduous lanceolate bracts up to a half inch long. The sepals are nearly linear or linear-lanceolate, greenish brown, acute, with the lateral ones slightly broader than the median one, all about an inch long. The lateral petals are linear-elliptic, one half to three quarters of an inch long, greenish in the center, purplish brown on the edges, obtuse. The lip is scoop-like, three fourths of an inch to an inch long, borne on the edge of the foot of the column (a downward projection of the column, which also bears the lateral sepals and the petals), 3-lobed, with the lateral lobes overlapping the base of the middle lobe when flattened out; the body purple-black, concave; the lateral lobes directed forward, green and flecked, margined with purple; the middle lobe much larger than the lateral ones, brownish-purplish, usually paler in the middle and sometimes slightly striate, with three irregularly papillose crests, a large papilla at the base of each lateral lobe, crisped on the edges. The column is hood-like, up to one half inch long, including the foot, yellowish green except the purple blotch at the base within, with a viscid cavity under the apical hood. The anther is terminal, with the sac tipped by a spreading stout beak which is notched at the apex. The pollinia are yellow, about one twenty-fifth of an inch long. The capsule is drooping, ellipsoid, an inch and a quarter to an inch and three quarters long, with three prominent ribs and three less prominent facial ribs.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Sketch of plant—leaves and flowering stem—one ninth natural size. Fig. 2.—Top of inflorescence. Fig. 3.—Front view of flower, showing, sepals, petal-lip, and column. Fig. 4.—Side view of flower with sepals and petals removed, showing column and foot and lip attached to the base of the foot. Fig. 5.—Capsule.

PSYCHOTRIA SULZNERI

(Plate 440)

PSYCHOTRIA SULZNERI

Wild-coffee

Native of peninsular Florida

Family RUBIACEAE — MADDER Family

Psychotria lanceolata Chapm. Fl. S. U. S. 177. 1860. Not *P. lanceolata* Nutt.
Psychotria tenuifolia A. Gray, Syn. Fl. N. Am. 1[2]: 31. 1886. Not *P. tenuifolia* Sw.
Psychotria Sulzneri Small, Fl. Miami 176. 1913.

If flowers by their color attract butterflies and insure pollination, many fruits through their color attract the attention of birds which help in the dissemination of the plants. At any rate, the shrubs with bright-colored fruits have been distributed in the Florida peninsula by the birds to their own benefit and incidentally to the interest of the botanist. The wild-coffee is a tropical type. Its ancestors evidently came from the West Indies, but it is now endemic in Florida. Whether it existed in its present form in the West Indies and died out there as a species after it became established in Florida, or still grows there yet undiscovered, or whether it changed from a related West Indian type after its arrival in Florida remains to be decided. The wild-coffee doubtless reached our mainland at a very early date, perhaps in later geologic time. At that time the Florida peninsula was hammock-clad—prior to the advent of the pines. If it was wide-spread at that time, it was driven from the encroaching pinelands and now exists in the tropical hammocks of the southern end of the peninsula and in natural hammock-remnants well up in the peninsula where there is sufficient protection from the destructive effects of cold spells on tropical vegetation. After the advent of man the more recent Florida aborigines made village sites whose soil was extraordinarily enriched through long occupations, and whose kitchenmiddens and burial mounds were likely places for vegetable growth. On these spots unusually luxuriant hammocks sprang up and formed refuges for birds, both local and migratory. On these artificial habitats one invariably finds the wild-coffee, planted there in comparatively recent though prehistoric times by migratory birds, thus growing as it were on islands clad with vegetation almost wholly foreign to that of the surrounding country.

There are many species of *Psychotria* in the West Indies. The floristics of southern Florida are strongly impregnated with West Indian types of vegetation and of species themselves. As a result of superficial observations some of the plants of Florida were associated

specifically with those of various West Indian islands, whereas careful examination proved them distinct, though sometimes closely related. This endemic Florida shrub was considered identical with two Antillean species for many years, the one originally from Cuba and the other originally from Jamaica. The leaves of some species of *Psychotria* contain rubber, as recently discovered by Thomas A. Edison; those of this species may yield up to nearly one per cent of good rubber.

The flowering branch on the accompanying illustration came from plants grown at the New York Botanical Garden collected in the Deering hammock at Cutler, Florida, the fruiting branch came from the hammock on the eastern shore of Lake Okeechobee, Florida.

The generic name, *Psychotria*, is derived from a combination of two Greek words signifying soul-nourishment; the seeds of some species are used in the tropics as a substitute for coffee, hence the name wild-coffee.

The wild-coffee is a shrub up to nine feet tall, the stem and the opposite branches minutely puberulent, nearly terete. The leaves are opposite, spreading, rather numerous; the blades are narrowly elliptic to elliptic-lanceolate, two and a half to six inches long, acute to acuminate, dark green, dull and with impressed veins above, dull, light green, puberulent, and with prominent veins beneath, entire, but often undulate, sessile, with the rather numerous lateral veins connected at the tips by an inframarginal vein. The cyme is terminal, naked, trichotomous, sessile, dense, sometimes congested, many-flowered. The buds are obovoid, puberulent. The flowers are rather inconspicuous, nearly sessile, inodorous. The hypanthium is campanulate, bright green, one twelfth of an inch long. The four to six sepals are minute, deltoid, acute. The corolla is greenish white, campanulate-rotate, with a campanulate tube; the four to six lobes are ovate. about as long as the tube or shorter, acute, spurred near the tip, minutely puberulent within, with the throat closed by a ring of hairs. The stamens are four to six. The filaments are somewhat clavate, adnate to near the top of the corolla-tube. The anthers are ellipsoid, fully as long as the free parts of the filaments. The ovary is green, with an annular top. The style is subulate, white or purplish. The stigma is minute. The drupes are borne in dense, often crowded clusters, subglobose, about a fifth of an inch in diameter, varying from orange to scarlet, more or less shining. The nutlets are oval, yellowish or brownish, flattened on the inner face, convex on the usually shallowly 5-grooved outer face.

JOHN K. SMALL.

EXPLANATION OF PLATE. Fig. 1.—Tip of leafy branch, in flower. Fig. 2.—Fruiting cyme. Figs. 3, 4.—Seeds.

IPOMOEA POLYANTHES

(Plate 441)

IPOMOEA POLYANTHES

Yellow Morning-glory

Native of the tropics and subtropics

Family CONVOLVULACEAE MORNING-GLORY Family

Convolvulus umbellatus L. Sp. Pl. 155. 1753.
Ipomoea umbellata Meyer, Prim. Fl. Esseq. 99. 1818. Not *I. umbellata* L. 1759.
Ipomoea polyanthes R. & S. Syst. 4: 234. 1819.
Convolvulus sagittifer H.B.K. Nov. Gen. 3: 100. 1819.
Ipomoea mollicoma Miquel, Stirp. Surin. Sel. 132, 1850.
Merremia umbellata Hallier f. Bot. Jahrb. 16: 552. 1893.

Conspicuous when in bloom, and one of the few yellow-flowered species of the large genus *Ipomoea*, this vine has a very wide range, from southern Florida nearly throughout the West Indies and continental tropical America, north to western Mexico and grows also in tropical regions of the Old World. It is known in Cuba and Porto Rico as "Aguinaldo amarillo". It usually inhabits thickets, twining on bushes, sometimes attaining a length of fifteen feet or more. Our illustration is from a vine studied by Mrs. Horne at Mayaguez, Porto Rico.

Ipomoea polyanthes is a slender, nearly smooth, herbaceous vine. The leaves are slender-stalked and from about two inches to nearly four inches long, varying in shape from ovate to lanceolate or nearly orbicular, with a cordate or sagittate base, the apex acute, acuminate, or obtuse, or rounded; they are glabrous or the under surface puberulent. The flowers are few or several together at the end of a long axillary peduncle, on pedicels from about half an inch to about an inch in length; the sepals are oval, blunt, mucronulate, about one third of an inch long; the bright yellow nearly funnelform corolla has a tube about an inch long and a spreading limb; the ovary is two-celled. The fruit is a subglobose capsule, about one third of an inch in diameter, which splits open when ripe, containing velvety seeds.

N. L. BRITTON.

EXPLANATION OF PLATE. Fig. 1.—A flowering end. Fig. 2.—A cluster of fruits

JUSSIAEA ANGUSTIFOLIA

(Plate 442)

JUSSIAEA ANGUSTIFOLIA

Yerba de Clavo

Native of the southeastern United States and tropical America

Family ONAGRACEAE EVENING-PRIMROSE Family

Jussiaea angustifolia Lam. Encyc. 3: 331. 1789.
Jussiaea octophila DC. Prodr. 3: 57. 1828.
Jussiaea suffruticosa Sintenisii Urban, Symb. Ant. 4: 469. 1910.

The genus *Jussiaea*, dedicated by Linnaeus to the eminent French botanist and physician Bernard de Jussieu (born 1699, died 1777), comprises about fifty species, of tropical and subtropical distribution, mostly American. They are perennial herbaceous plants or low shrubs, mostly inhabiting wet or moist open situations, some of the species aquatics. Their leaves are alternate, nearly always entire-margined, their flowers solitary in the axils. The calyx has a prismatic or cylindric tube, not prolonged beyond the ovary, its limb four-parted to six-parted. There are from four to six, usually yellow petals, mostly longer than the calyx-segments, from eight to twelve stamens and a four-celled to six-celled ovary. The fruit is a cylindric, prismatic, or clavate capsule, ribbed or angular, deteriorating in age, containing many small or minute seeds. *Jussiaea peruviana*, another widely distributed species of this genus, has been illustrated on plate 118 of ADDISONIA.

Jussiaea angustifolia, one of the larger species of the genus, grows in southern Florida and Texas, inhabiting marshes and ditches, as also in the West Indies; in continental tropical America it ranges from northern Mexico to Bolivia, French Guiana, and Paraguay. This species has been confused in botanical literature with *Jussiaea suffruticosa* of Linnaeus.

Our illustration is from a painting by Mrs. Horne of a plant growing at Mayaguez, Porto Rico.

The yerba de clavo is a stout herb, upright, usually branched, sometimes three feet high, usually lower. The thin, linear to oblong-lanceolate leaves are from one to four inches long, short-stalked, pinnately veined. The stalked flowers are showy, with an angled calyx-tube, four lanceolate calyx-segments, four large, obovate, yellow, fugacious petals and eight short stamens. The nearly cylindric capsule becomes from an inch and a half to two and one half inches in length, tapering at the base, containing seeds arranged in several rows in each of its cavities.

N. L. BRITTON.

TETRAZYGIA ELAEAGNOIDES

(Plate 443)

TETRAZYGIA ELAEAGNOIDES

Cenizo

Native of Porto Rico, the Virgin Islands, and Hispaniola

Family MELASTOMATACEAE MEADOW-BEAUTY Family

Melastoma elaeagnoides Sw. Prodr. 72. 1788.
Tetrazygia elaeagnoides DC. Prodr. 3: 173. 1828.

The meadow-beauty family, represented in temperate North America only by a few species of the herbaceous genus *Rhexia*, attains great development in tropical regions, especially in northern South America, comprising in all some twenty-five hundred species, grouped in about one hundred and fifty genera; most of them are shrubs or small trees. All have opposite leaves, mostly with three to nine strong nerves, regular, often showy, variously clustered flowers, the often inclined or declined stamens as many or twice as many as the petals, with anthers opening by pores; the fruit is either a berry or a capsule.

The genus *Tetrazygia* (Greek, referring to the four-parted flowers of the typical species), proposed by L. C. Richard and published by de Candolle in 1828, comprises sixteen species of shrubs and trees, all West Indian, bearing rather small clustered flowers at the ends of the branches. The calyx is constricted just above the ovary, with a four-lobed or five-lobed or nearly truncate limb. There are four or five obovate petals and eight or ten stamens with slender filaments and narrow anthers. The ovary is four-celled or five-celled, the filiform style curved, the stigma very small. The fruit is a fleshy berry.

Our illustration is reproduced from Mrs. Horne's painting of a plant growing at Hato Rey, near San Juan, Porto Rico.

Tetrazygia elaeagnoides is a tree, reaching a maximum height of about thirty-five feet, with the bark separating in thin, narrow flakes, the very slender twigs scurfy. The narrowly oblong or oblong-lanceolate leaves are short-petioled, three-nerved, dull green on the upper side, whitish-canescent beneath. The flowers are few, in small clusters mostly shorter than the leaves. The calyx is scurfy, about one fifth of an inch long, its limb with four short lobes. There are four white petals about twice as long as the calyx. The fruit is a four-lobed berry, about a third of an inch thick.

N. L. BRITTON.

CHAMAECRISTA SWARTZII

(Plate 444)

CHAMAECRISTA SWARTZII

Tamarindillo

Native of the eastern Antilles

Family CAESALPINIACEAE — SENNA Family

Cassia Swartzii Wickstr. Sv. Vet.-Akad. Handl. **1825**: 430. 1826.
Chamaecrista complexa Pollard, Field Mus. Bot. **2**: 47. 1900.
Chamaecrista Swartzii Britton, Bull. Torrey Club **44**: 9. 1917.
Cassia glandulosa Swartzii F. Macbride, Contr. Gray Herb. **59**: 26. 1919.

The genus *Chamaecrista* Moench (Greek, a low crest), established in 1794, includes about one hundred species of herbaceous plants and low shrubs widely distributed in temperate and tropical regions; two of them, *C. nictitans* and *C. fasciculata*, range north into the northeastern United States; there are several species in Florida, and many in the West Indies and continental tropical America. Two have already been illustrated in ADDISONIA, *C. Deeringiana* of Florida on plate 121, aud *C. mirabilis* of Porto Rico on plate 335.

They all have alternate, evenly pinnate, stipulate leaves, in some kinds sensitive to shock, the leaflets mostly several or many pairs, but in some tropical species only one or two pairs. The yellow flowers are solitary or in small clusters at or above the leaf-axils; the five calyx-lobes are pointed; there are five petals variously unequal in size and shape; the five or ten stamens usually all have anthers which open by a terminal pore. The fruit is a linear, flat legume, its valves elastically separating and twisting.

Chamaecrista Swartzii is frequent on banks and hillsides and in thickets, at lower and middle elevations, on Porto Rico, Hispaniola, the Virgin Islands, and the Lesser Antilles, conspicuous when in flower. Our illustration is from a plant growing in the Porto Rico mountains between Aibonito and Coamo.

The *tamarindillo* is a slender, somewhat hairy shrub, about five feet high or lower, conspicuous when in flower. The leaves are short-stalked, the petiole bearing a stipitate gland or sometimes two; there are from fifteen to twenty-five pairs of oblong or oblong-obovate thin obtuse cuspidate leaflets about half an inch long, with a nearly central midvein and many lateral veins. The showy, flowers are solitary or two or three together above the leaf-axils; they are about one inch broad, the unequal petals longer than the sepals, and there are five unequal stamens. The pod is narrowly linear, about two inches long and one sixth of an inch wide.

N. L. BRITTON.

COLUMNEA TULAE

(Plate 445)

COLUMNEA TULAE

Tibey parasitico

Native of Porto Rico

Family GESNERIACEAE — GESNERIA Family

Columnea Tulae Urban, Symb. Ant. 1: 409. 1899.

The tropical American genus *Columnea* was dedicated by Linnaeus to the eminent Italian Fabio Colonna, who lived from 1567 to 1640. It includes about seventy-five species of shrubby plants, many of them epiphytes, attached to trees by aerial roots. They have opposite leaves and axillary, red or yellow flowers. The calyx is five-cleft or five-parted. The corolla-tube is straight or somewhat curved, the limb two-lipped. There are four perfect stamens, borne at the base of the corolla-tube, their anthers coherent, and one separate, imperfect stamen (staminodium). The pistil has a superior one-celled ovary, a slender style and a cleft or entire stigma. The fruit is berry-like, the numerous seeds small,

The present species is confined to Porto Rico, growing on trees in wet or moist districts, most abundant in mountain forests. Mrs. Horne's painting was made from a plant growing on a tree near Comerio.

The stem of *Columnea Tulae* is two feet long, or shorter, four-sided and hairy. The leaves are oblong or elliptic, entire-margined or obscurely crenate, short-hairy on both sides, one or two inches long, short-stalked, rather strongly pinnately veined, the apex acute or obtuse. The stalked flowers are solitary at the axils; the calyx is about half an inch long, its lanceolate, hairy, pointed segments separate nearly to the base; the corolla is about two inches long, yellow, red, or scarlet, its finely hairy, slender tube much longer than the limb. The nearly globular, white fruit is nearly a half inch in diameter.

N. L. BRITTON.

PLATE 446

ADDISONIA

RUBUS ROSAEFOLIUS

(Plate 446)

RUBUS ROSAEFOLIUS

Mountain Raspberry

Native of southeastern Asia

Family ROSACEAE — ROSE Family

Rubus rosaefolius Smith, Pl. Ic. Ined. *pl. 60.* 1791.
Rubus rosaefolius coronarius Sims, Bot. Mag. *pl. 1783.* 1816.

This is an Asiatic species of the large genus *Rubus*, which has become so thoroughly naturalized in some of the West Indian islands as to appear indigenous. It is established in Cuba, Hispaniola, Porto Rico, St. Kitts, Guadeloupe, Dominica, Martinique, Montserrat, and St. Vincent, in Hawaii, and locally in Colombia, Peru, and Brazil. The date of its introduction into the West Indies is not accurately known. No record is made of it in the Lesser Antilles in Grisebach's "Flora of the British West Indies," published 1859-1864, but a specimen in Dr. Torrey's herbarium collected in Guadeloupe by Dr. Madiana, proves its occurrence in that island prior to 1827. Its beautiful red, or sometimes orange, fruit is edible; in Porto Rico where the plant is superabundant locally in moist or wet districts it is extensively collected and sold under the Spanish name *freses*, which properly applies to strawberries. On the Porto Rican mountain roads children appear at frequent intervals with baskets of this attractive fruit for sale to travellers. The variety *coronarius* is the double-flowered form of the species, occasionally planted for ornament and sometimes escaped from gardens in Porto Rico.

Plate 446 is reproduced from a painting of a plant at Aibonito, Porto Rico.

Rubus rosaefolius is a weak shrub, about three feet high, or lower, the slender, often recurved branches armed with small prickles. Its pinnate leaves have from three to fifteen leaflets; the petioles are hairy, the stipules very narrow; the thin, hairy or smooth leaflets are ovate or lanceolate, rather strongly veined, from one and one half to about three inches long, toothed, pointed, the lateral ones sessile, the terminal one long-stalked; the flowers are solitary or two or three together, an inch to an inch and a half broad, on hairy, usually prickly stalks; there are five narrowly lanceolate, long-pointed sepals, five obovate, white petals, and numerous short stamens. The fruit is thimble-shaped or nearly globular.

N. L. BRITTON.

VOLKAMERIA ACULEATA

(Plate 447)

VOLKAMERIA ACULEATA

Prickly Myrtle

Native of tropical America

Family VERBENACEAE — VERVAIN Family

Volkameria aculeata L. Sp. Pl. 637. 1753.
Clerodendron aculeatum Griseb. Fl. Brit. W. Ind. 500. 1861.
Ovieda aculeata Baill. Hist. Pl. 11: 95. 1892.

The genus *Volkameria* was established by Linnaeus in 1753, in honor of the Nuremberg botanist J. C. Volckamer (born 1644, died 1720). It is a vine-like, spiny shrub, with petioled, opposite, small entire-margined leaves, the white flowers borne in cymes. The small bell-shaped calyx is five-toothed; the salverform corolla has a slender tube and a five-lobed limb; there are four long and slender, purple, unequal stamens, about as long as the slender style. The fruit is globular, four-grooved, containing four nutlets united in pairs.

The only species of the genus inhabits coastal thickets and hillsides nearly throughout tropical America, usually, or always, within saline influence. In Porto Rico the Spanish name *escambron blanco* is applied to it and it is called "crab prickle" in the Virgin Islands. Mrs. Horne's painting, here reproduced, was made from a bush growing near the southern coast of Porto Rico near Santa Isabel.

Volkameria aculeata is bushy, sometimes half-climbing, with stems about ten feet long or shorter. The slender branches are finely and densely hairy and armed with stout opposite spines one sixth to one third of an inch long. The slender-stalked leaves vary from oblong to elliptic-obovate, and from about an inch to two inches long, the apex pointed, the base narrowed. The flowers are few together in stalked cymes, borne on puberulent pedicels one fourth to more than half of an inch long; the small calyx has five acute teeth; the tube of the corolla is about three quarters of an inch long, its limb about half an inch wide. The slightly fleshy fruit is a quarter to a third of an inch in diameter.

N. L. BRITTON.

EXPLANATION OF PLATE. Fig. 1.—A flowering branch. Fig. 2.—The fruit.

PENTARHAPHIA ALBIFLORA

(Plate 448)

PENTARHAPHIA ALBIFLORA

Porto Rico Pentarhaphia

Native of Porto Rico

Family GESNERIACEAE — GESNERIA Family

Pentarhaphia albiflora Decaisne, Ann. Sci. Nat. III. 6: 101. 1849.
Gesneria albiflora Kuntze, Rev. Gen. 473. 1891.

This is a rather common shrub or small tree in Porto Rico, and is restricted in distribution to that island. It inhabits woodlands, thickets, rivet-banks, and hillsides in both moist and dry districts. but has not been observed in the forests of the higher mountains. Mrs. Horne's painting was made from a shrub found between Caguas and Cayey.

The genus *Pentarhaphia* was established by Lindley in 1827, the name (Greek) given with reference to the five-ribbed calyx-tube; there are some thirty species known, all shrubs and small trees, natives of tropical America. They have rather thick, entire-margined or denticulate leaves and usually long-stalked flowers. The calyx-tube is adnate to the ovary, the five calyx-lobes narrow. The corolla is more or less bell-shaped, with a five-lobed, somewhat oblique or two-lipped limb. There are four perfect stamens with long slender filaments, their anthers coherent. The style is also long and slender. The capsular fruit is about as long as the calyx-tube.

Pentarhaphia albiflora sometimes forms a small tree, twelve to sixteen feet high, but is usually shrubby and lower. Its slender twigs and its leaves are glabrous. The leaves are from two to about four inches long, and vary from oblong-lanceolate to elliptic-obovate, the apex pointed, the base narrowed, the petioles short. The slender peduncles are longer than the leaves and bear from one to four flowers about an inch long; the calyx-lobes are narrowly linear, about as long as the tube; the corolla is remarkably various in color, white, yellow, brownish, or mottled, or the limb purplish. The capsule is slightly longer than the calyx-tube.

N. L. BRITTON.

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Bold face type is used for the Latin names of plants illustrated; SMALL CAPITALS for Latin names of families illustrated and for the names of the authors of the text; *italics* for other Latin names, including synonyms.