CURTIS'S
BOTANICAL MAGAZINE,

COMPRISING THE

Plants of the Royal Gardens of Kew,

AND

OF OTHER BOTANICAL ESTABLISHMENTS IN GREAT BRITAIN;

WITH SUITABLE DESCRIPTIONS;

BY

SIR JOSEPH DALTON HOOKER, M.D., C.B., G.C.S.I.,
F.R.S., F.L.S., ETC.,
D.C.L. OXON., LL.D. CANTAB., MEMBER OF THE INSTITUTE OF FRANCE.

VOL. LVII.
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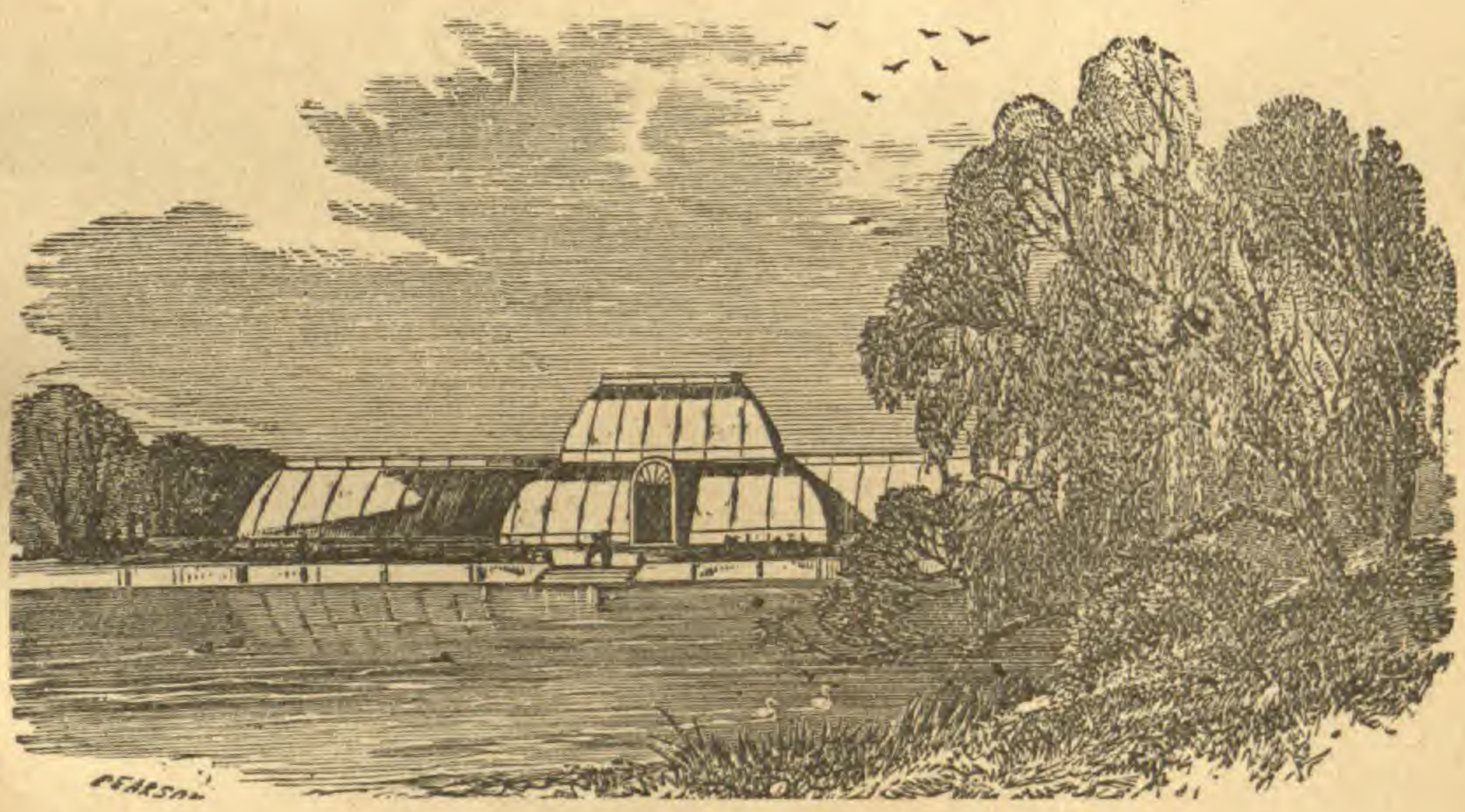

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Of Frensham Hall, Shottermill, Haslemere.

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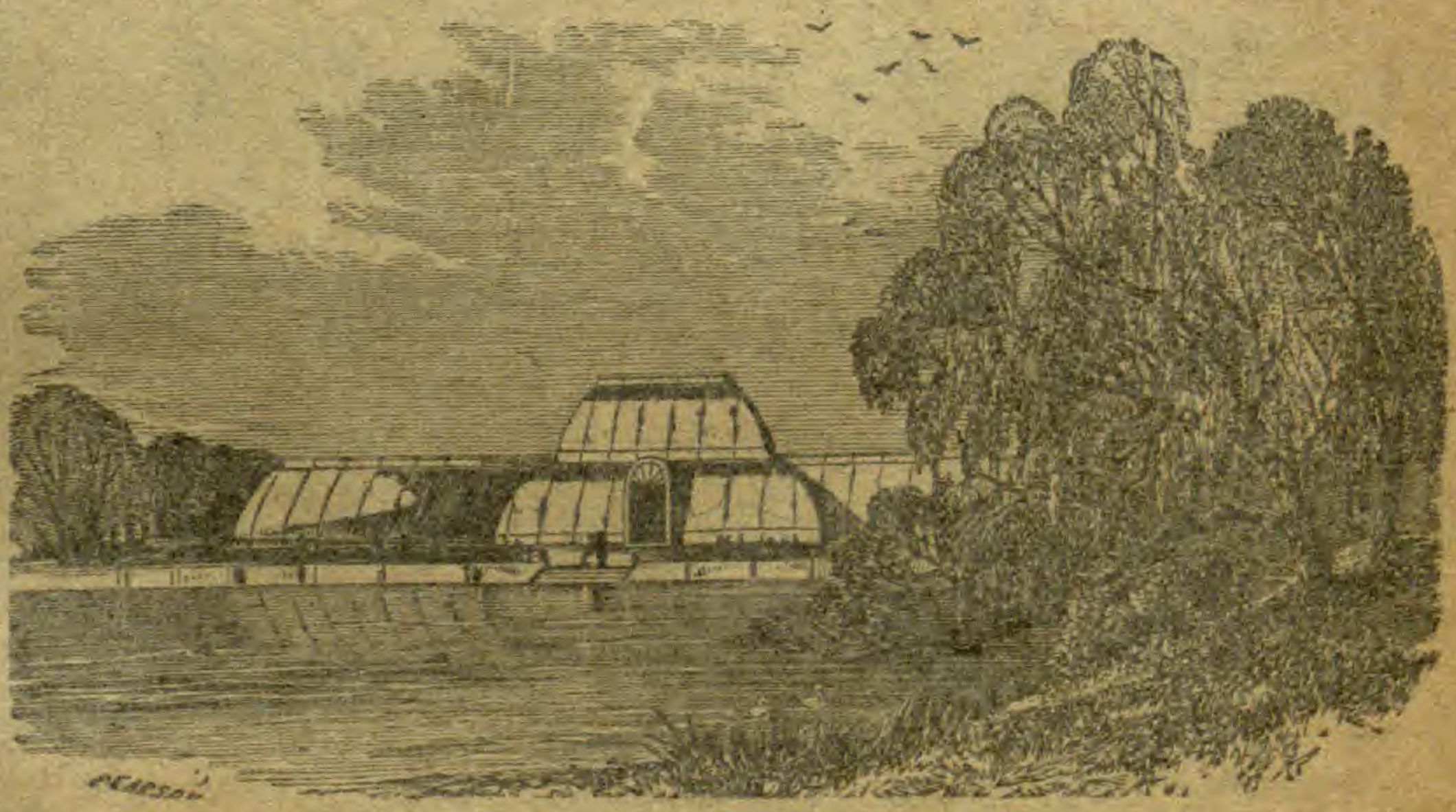
Late Director of the Royal Botanic Gardens of Kew.



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Tab. 7752.

HIBISCUS Manihot.

Native of China and Japan.

Nat. Ord. Malvaceæ.—Tribe Hibisceæ.

Genus Hibiscus, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 207).

Hibiscus (Abelmoschus) *Manihot*; herba annua v. 2–3-ennis, erecta, robusta, sparse pilosa, caule simplici v. ramoso, ramis erectis, foliis amplis palmatim 5–7-lobatis lobis lineari-oblongis lanceolatisve grosse dentatis serratis v. lobulatis, petiolo robusto, stipulis lanceolatis, bracteis parvis pinnatifidis deciduis stipulis persistentibus instructis, pedicellis robustis florentibus deflexis, involucelli bracteolis 4–6 ovatis v. ovato-lanceolatis hirsutis persistentibus, calyce spathaceo 5-dentato basi circumscisso hispido, corolla 2–5½ poll. diam. sulphurea fundo purpurea, tubo staminifero undique laxe v. confertim antherifero, stigmatibus clavatis decurvis purpureis apice dilatatis retusis, capsula oblonga acuminata pentagona hispida.

H. Manihot, *Linn. Sp. Pl.* p. 696. *Cav. Diss.* vol. iii. p. 172. *Thunb. Fl. Jap.* p. 272. *Ait. Hort. Kew.* Ed. ii. vol. iv. p. 229. *Bot. Mag.* t. 1702, et t. 3152 (var. β). *DC. Prodr.* vol. i. p. 448. *Franch. et Sav. Enum. Pl. Jap.* p. 64. *Miq. Ann. Mus. Bot. Lugd. Bat.* vol. iii. p. 19. *Masters in Fl. Brit. Ind.* vol. i. p. 341; *in Gard. Chron.* 1897, vol. ii. p. 249, fig. 74. *W. Wats. in The Garden* vol. liii. (1898) p. 127, *cum ic.*

H. palmatus, *Cav. Diff.* p. 168, t. 63, fig. 1.

H. papyriferus, *Salisb. Prodr.* p. 384.

H. pentaphyllus, *Roxb. Hort. Beng.* p. 52; *Fl. Ind.* vol. iii. p. 212.

H. pungens, *Hort.*

H. fol. palmato-digitat., &c., *Linn. Hort. Upsal.* p. 206. *Hort. Cliff.* p. 350.

Bamia Manihot, *Wall. Cat.* n. 1926.

Abelmoschus Manihot, *Medic. Malvenfam.* p. 46.

Ketmia, fol. Manihot., &c., *Dill. Hort. Eltham.* p. 189, t. 156, fig. 189.

Alcea, fol. Manihot., &c., *Pluk. Amalth.* p. 7, t. 155, p. 2.

The specimens of *H. Manihot*, from which the figures published on Plates 1702 and 3152 of this work were taken, give no idea of the size and beauty of the flowers as here represented. It is a native of China and Japan. Linnæus and, following him, Cavanilles and De Candolle, give India as its native country, overlooking the testimony of the "Flora Japonica" and other works. It is, indeed, commonly cultivated in Indian gardens, having been introduced, according to Roxburgh, from China. The roots, which are large and soft, yield a mucilage used for stiffening

paper in Japan, on which account Salisbury unjustifiably rejected Thunberg's name for that of *papyriferus*.

H. Manihot must have been introduced into England before the year 1732, when Dillenius described it as a bi-triennial, growing in Sherard's garden at Eltham. Aiton mentions its being cultivated in the Chelsea Garden in 1812, whence a specimen was sent to the Royal Society as one of the fifty plants claimed annually by the Society as a condition under which that garden was held by the Society of Apothecaries (see Phil. Trans. n. 333, p. 417, n. 64). The specimen here figured is from a plant in the Mexican compartments of the Temperate House of the Royal Gardens, which made in three months shoots nine feet high, flowered for two consecutive months, and ripened seed.

Descr.—A tall, erect, stout, sparsely hairy, annual or bi-triennial, four to nine feet high; branches terete, erect. *Leaves* up to a foot in diameter, orbicular or orbicular-ovate in circumscription, palmately five- to seven-lobed, lobes linear-oblong or lanceolate, acuminate, coarsely toothed serrate or lobulate, dark green; petiole stout, about as long as the blade; stipules lanceolate or subulate. *Bracts* at the base of the pedicels small, pinnatifid, stipulate, deciduous, except the stipules. *Flowers* two to five and a half inches in diameter, pedicels deflexed when flowering, erect in fruit. *Involucel* of four to six ovate- or ovate-lanceolate, acute, persistent, hirsute, bracteoles half an inch to an inch long. *Calyx* rather longer than the involucel, spathaceous, five-toothed, circumsciss at the base. *Corolla* pale yellow, purple at the base, lobes rounded. *Staminiferous column* loosely or closely covered with anthers. *Stigmas* decurved, purple, tips dilated, retuse. *Capsule* oblong, acute, one to two inches long, acuminate, hispid.—*J. D. H.*

Fig. 1, portion of carpels and of staminal tube with style and stigmas; 2 and 3, anthers; 4, seed (*nat. size*); 5, seed:—All but fig. 4 *enlarged*.

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Tab. 7753.

LHOTSKYA ericoides.

Native of King George's Sound.

Nat. Ord. Myrtaceæ.—Tribe Chamælaucieæ.

Genus Lhotskya, *Schau.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 699.)

Lhotskya *ericoides*; fruticulus erectus, foliosus, ramulis erectis virgatis glanduloso-pilosulis, foliis ½-pollicaribus erecto-patentibus subconfertis anguste linearibus fere acicularibus teretibus strictis obtusis vel apiculatis glaberrimis, floribus axillaribus sessilibus secus ramulos confertis in fasciculos cylindraceos dispositis 2-bracteolatis, bracteolis subulatis calycis tubum elongatum 5-costatum costis scaberulis subæquantibus, calycis lobis parvis ovato-rotundatis, petalis calyce fere duplo longioribus lineari-lanceolatis acutis, staminibus numerosis petalis æquilongis, antheris minimis flavis.

L. ericoides, *Schauer in Lindl. Introd. Nat. Syst. Bot.* Ed. ii. p. 439; *in Linnæa*, vol. x. (1835-6) p. 309; *in Nov. Act. Acad. Nat. Cur.* vol. xix. Suppl. II. (1841) p. 235; *Plant. Preiss.* vol. i. p. 103. *Benth. Fl. Austral.* vol. iii. p. 55.

L. scabra, *Turcz. in Bull. Soc. Nat. Mosc.* 1862, vol. ii. p. 324.

L. hirta, *Regel, Gartenfl.* vol. xii. (1863), p. 337, t. 415; *in Trans. Hort. Soc. Russ.* 1863, t. 141 ic. it.

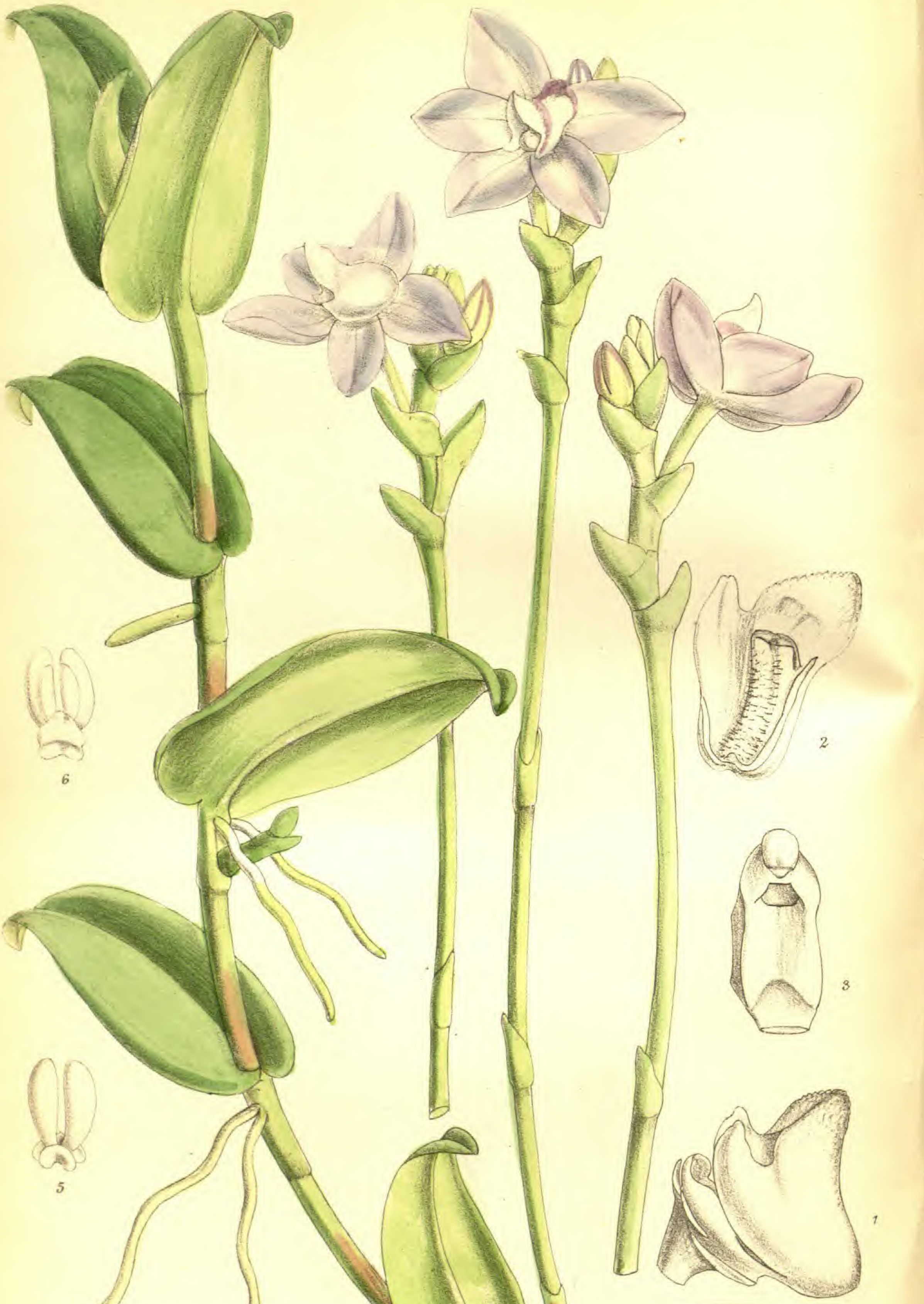
Lhotskya is a genus of eight species, natives of South and Western Australia, from Victoria westwards, of which *L. ericoides* is confined to the King George's Sound and the adjoining district. The genus is so closely allied to the much larger one of *Calythrix* (see tab. 3323), differing only in the absence of a bristle terminating each calyx-lobes, that it might well be regarded as a section of the latter. The name it bears is that of Johann Lhotsky, a traveller and naturalist who collected in Madeira (where I met him in 1839), Brasil, Australia, and Tasmania. He was author of a paper on the Botanical Geography of New Holland, published in "Hooker's London Journal of Botany," vol. ii. (1843), p. 135.

The specimen here figured was raised from seeds collected in Australia by Mr. James Veitch in 1893, and was presented by him to the Royal Gardens, Kew, where it flowered in a cool house in June, 1900. It was then about two feet high.

Descr.—A small, erect, nearly glabrous shrub, with slender, strict, erect branches, covered with needle-like

leaves; branches sparsely glandular-hairy. *Leaves* about half an inch long, erecto-patent, strict, very narrowly linear, almost acicular, terete, obtuse or apiculate, bright green, quite glabrous. *Flowers* small, axillary, solitary from each leaf axil, but together forming cylindrical fascicles about the middle of the leafing branchlets, sub-sessile, bibracteolate. *Bracteoles* subulate, about as long as the calyx-tube. *Calyx-tube* narrow, cylindric, five-ribbed, ribs scaberulous; lobes very small, orbicular. *Petals* about twice as long as the calyx-tube, subulate, acuminate, white or nearly so. *Stamens* very many; filaments rather longer than the petals; anthers minute, very pale yellow. *Style* very slender.—*J. D. H.*

Fig. 1, portion of branch and leaf; 2, flower and bracteoles; 3, the same with the petals removed; 4 and 5, anthers:—*All enlarged.*



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Tab. 7754.

SARCOCHILUS lilacinus.

Native of the Malayan Peninsula and Islands.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Sarcochilus, *Br.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 575.)

Sarcochilus (Cuculla) *lilacinus*; glaberrimus, caule scandente subrobusto elongato basi decumbente, radicibus elongatis vaginas foliorum perforantibus, foliis carnosulis alternis oblongis v. ovato-oblongis patenti-recurvis apicibus subacutis recurvis basi cordatis amplexicaulibus dorso carinatis enerviis pallide viridibus, pedunculis 8–10-pollicaribus robustis vaginis 2–3 obtusis ornatis, racemo 1–8-pollicari pauci- v. multifloro, rhachi crassa compressa, bracteis distichis ovatis obtusis carnosis, floribus breviter pedicellatis ad $1\frac{1}{2}$ poll. latis pallide roseo-lilacinis, sepalis petalisque patulis late ovatis subacutis, labello sepalis dimidio breviore stipitato saccato, lobis lateralibus brevibus incurvis terminali rotundato, disco callo truncato pubescente instructo.

S. lilacinus, *Griff. Notul.* vol. iii. p. 334; *Ic. Pl. Asiat.* t. 320, f. 2. *Hook. f. Fl. Brit. Ind* vol. vi. p. 40. *Ridley in Trans. Linn. Soc. Bot.* per. ii. vol. iii. (1893) p. 371.

S. lilacinus & amplexicaulis, *Reichb. f. in Walp. Ann.* vol. vi. p. 499.

Dendrocolla amplexicaulis, *Blume Bijdr.* p. 288.

Ærides amplexicaule, *Lindl. Gen. & Sp. Orchid.* p. 239.

Orsidice amplexicaulis and lilacinus, *Reichb. f. in Bonplandia*, vol. ii. p. 93.

Thrixspermum amplexicaule & T. lilacinum, *Reichb. f. Xen. Orchid.* vol. ii. p. 121.

Sarcochilus lilacinus is a native of swamps in the Malayan Peninsula, from Perak southward to Singapore; also of Java, where it was described by Blume in 1825. Its habit of growth, climbing amongst bushes, is very unusual in the Order to which it belongs. The specimen figured was sent to the Royal Gardens, Kew, from Singapore by Mr. H. N. Ridley, M.A., F.L.S., Director of Forests and Gardens, Singapore. It flowered in a warm house in June, 1900, the individual flowers lasting only one day.

Descr.—*Stem* about as thick as a crow-quill, decumbent below, then ascending and more or less scandent, by aid of the long vermiform white roots, which perforate the tubular, closely appressed leaf-sheaths. *Leaves* alternate, one and a half to two inches long, oblong or ovate-oblong,

base cordate and amplexicaul, tip sub-acute, recurved, pale green, keeled beneath. *Peduncles* eight to ten inches long, erect, bearing two or three tubular, appressed, obtuse sheaths. *Raceme* one to eight inches long; rhachis very stout, compressed, few- or many-flowered; bracts distichous, ovate, obtuse, fleshy. *Flowers* very shortly pedicelled, about an inch and a half broad, pale rose-lilac. *Sepals* and *petals* sub-equal, ovate, sub-acute. *Lip* much shorter than the sepals, shortly clawed, saccate; lateral lobes short, obtuse, incurved, terminal much broader, rounded; disk with a broad, linear, truncate, pubescent callus. *Pollinia* two perfect, oblong, each with an imperfect, much smaller one, adnate to it, seated on a lobulate gland.—*J. D. H.*

Fig. 1, lip; 2, vertical section of same; 3, column; 4, anther; 5 and 6, pollinia: —*All enlarged.*

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Tab. 7755.

PYRUS tianschanica.

Native of Central Asia.

Nat. Ord. Rosaceæ.—Tribe Pomeæ.

Genus Pyrus, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 626.)

Pyrus (Sorbus) *tianschanica*; arbor parva, foliis impari-pinnatis glaberrimis (novellis tomentosis), foliolis 6–7-jugis lanceolatis acuminatis serrulatis basin versus integerrimis subcoriaceis supra saturate viridibus opacis subtus pallidis, stipulis lanceolatis brunneis caducis, paniculis corymbosis axillaribus glaberrimis laxifloris, floribus ad ¾ poll. diam. breviter pedicellatis, bracteis minutis subulatis caducis, calycis pubescentis lobis late triangularibus acutis, petalis albis, carpellis 5 hirsutis, fructu globoso ½ poll. diam.

P. tianschanica, *Franch. in Ann. Sc. Nat.* Ser. vi. vol. xvi. (1883) p. 287.

P. thianschanica, *Rupr. ex Regel, Gartenfl.* vol. xl. (1891) p. 7, f. 4.

Sorbus tianschanica, *Rupr. Sert. Tiansch.* p. 46.

The Mountain Ash here figured is the close ally and Central Asiatic representative of the European *P. Aucuparia*, from which it differs in the perfectly glabrous (when mature) leaves, lanceolate, serrate, finely acuminate leaflets of a thicker texture, and not shining above, in the larger flowers and five carpels. It is a native of the Tianschan range, which bounds Turkestan on the north, where it was discovered by Baron Osten Sacken and Dr. A. Regel, during their expedition to the Tianschan in 1867. It has also been collected in about the same latitude, but much further east, in the mountains of the Chinese Province of Kansu (north of the Gobi desert), by Przewalski.

The specimen figured is from a small tree in the Arboretum of the Royal Gardens, Kew, which was purchased in 1896 from Messrs. Transon Bros., Orleans, France, which flowered in May, 1900, and fruited in the following July.

Descr.—A small tree, with the habit of *P. Aucuparia*, young shoots tomentose. *Leaves* about six inches long, shortly petioled, impari-pinnate; leaflets six to seven pairs and a terminal, two inches long, lanceolate, acuminate, serrulate, quite glabrous, rather thick in texture, upper

surface dark green, not shining, tender, pale green. *Stipules* half an inch long, lanceolate, pale brown, caducous. *Panicles* axillary, together forming a terminal corymb, loosely many-flowered, quite glabrous. *Bracts* minute, subulate, deciduous. *Flowers* shortly pedicelled, three-fourths of an inch in diameter. *Calyx* pubescent, lobes broadly triangular, acute. *Petals* white. *Carpels* five, hirsute. *Berries* globose, one-third of an inch in diameter, bright right.—*J. D. H.*

Fig. 1, flower; 2 and 3, stamens; 4, carpel:—*All enlarged.*

2

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TAB. 7756.

ALLIUM OSTROWSKIANUM.

Native of Western Turkestan.

Nat. Ord. LILIACEÆ.—Tribe ALLIEÆ.

Genus ALLIUM, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 802.)

ALLIUM (Schœnoprasum) *Ostrourskianum*; bulbo subgloboso, tunicis tenuibus integris, foliis 2 supra-basilaribus umbellam superantibus ad ⅔ poll. latis linearibus acuminatis concavis flaccidis glaucis, spathæ valvis ovatis acuminatis pedicellis filiformibus pollicaribus multoties brevioribus, umbella globosa multiflora capsulifera, perianthii segmentis basi connatis ellipticis subacutis ad ½ poll. longis læte roseis interioribus majoribus, filamentis supra basin segmentorum insertis ima basi connatis exterioribus triangularibus brevissime mucronatis interioribus angustioribus, antheris oblongis apiculatis, ovario substipitato late ovoideo trilobo, stylo brevi, stigmate minuto 3-lobo.

A. Ostrowskianum, *Regel in Act. Hort. Petrop.* vol. vii. (1880) p. 545; *Gartenfl.* vol. xxxi. (1882) p. 225, t. 1089.

The very handsome *Allium* here figured was discovered in Western Turkestan by Mr. Fetisow, who sent bulbs of it to the Imperial Botanical Gardens of St. Petersburg, where it was described by the monographer of the genus, Dr. Regel. It bears the name of the Russian Minister of Imperial Domains, Michael Nicolajewitsch von Ostrowski, a liberal promoter of science. It has long been in cultivation in the Royal Gardens, Kew, where it flowers annually in an open border, but the specimen figured was communicated by the Hon. Charles Ellis, of Trensham Hall, Haslemere, in June of last year.

Descr.—*Bulb* sub-globose, outer seeds thin, entire. *Leaves* two, a foot and a half to two feet long, by two-thirds of an inch broad, linear, acuminate, concave above, flaccid, pale green, glaucous. *Scape* much shorter than the leaves, slender, terete. *Umbel* globose, laxly many-flowered, about three and a half inches in diameter. *Spathes* two, very short, ovate, acuminate. *Pedicels* an inch long, very slender. *Flowers* cup-shaped. *Perianth*-segments half an inch long, bright rose-red, with a green median nerve, elliptic, sub-acute, connate at the base, inner much smaller. *Stamens* half the length of the

perianth-segments, inserted above the bases of the segments; filaments connate at the very base, of the outer stamens triangular, with a minute, subulate tip, of the inner much narrower; anthers small, oblong, apiculate. *Ovary* shortly stipitate, broadly ovoid, three-lobed; style very short, stigma minutely three-cleft.—*J. D. H.*

Fig. 1, three perianth-segments and stamens; 2, ovary.

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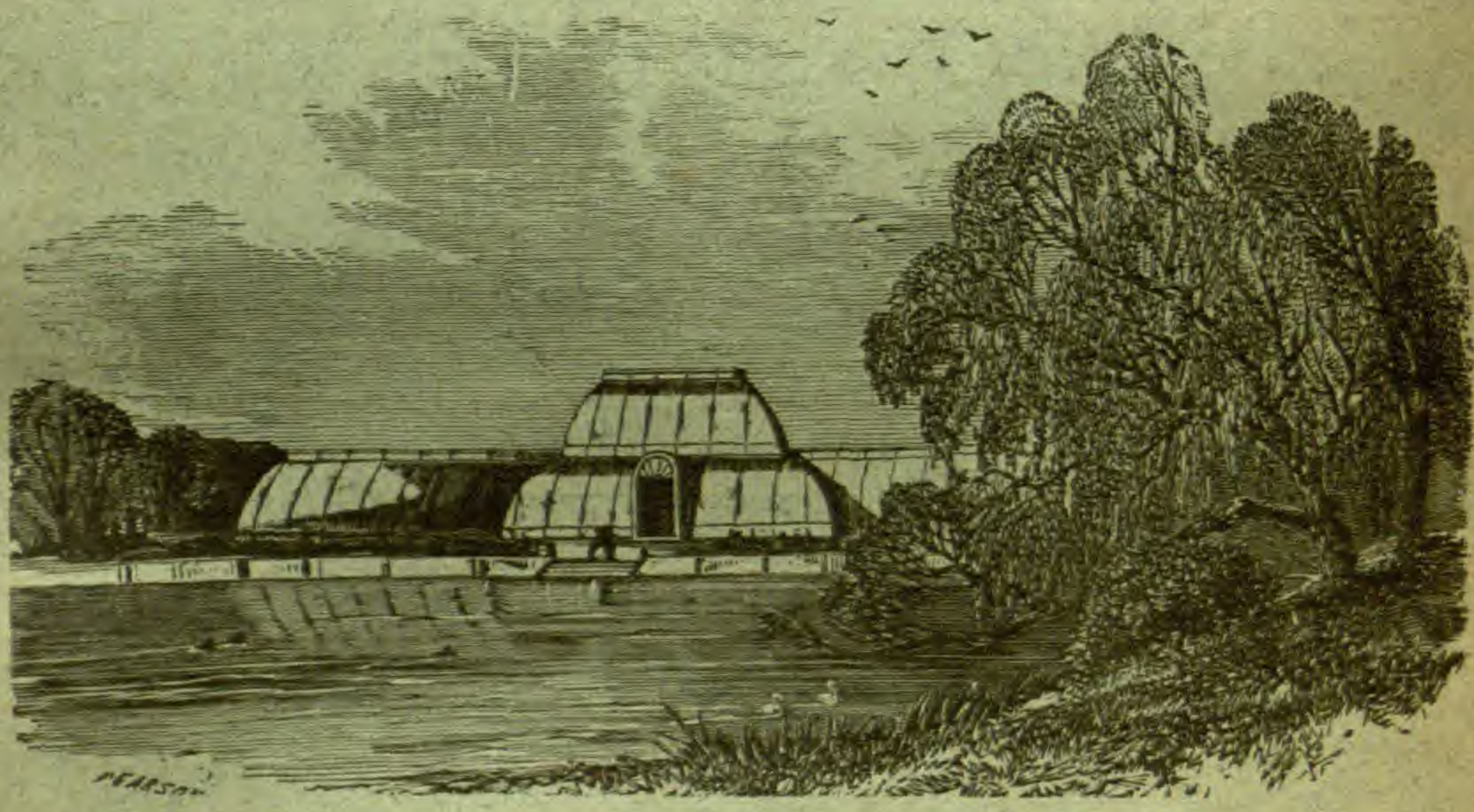

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TAB. 7757.

AGAVE PEACOCKII.

Native of Central Mexico.

Nat. Ord. AMARYLLIDEÆ.—Tribe AGAVEÆ.

Genus AGAVE, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 738.)

AGAVE (Littæa) *Peacockii*; acaulis, foliis densissime rosulatis in catervam subhemisphericam 4 ped. diam. congestis extimis patulis intimis erectis omnibus ensiformi-oblanceolatis coriaceo-carnosis medio 4 poll. latis apice in spinam rigidam fere pollicarem brunneam productis basin versus angustatis saturate viridibus medio versus pallidis, marginibus non corneis, spinis marginalibus inæqualibus irregulariter subdistanter insertis brunneis majoribus e basi elongata nunc fere ½ poll. longa repente incurvis pungentibus, scapo cum inflorescentia 14 ped. alto viridi inferne bracteis lanceolatis sparsis aucto, inflores entia valde angusta subspicæformi stricta e fasciculis innumeris crasse pedunculatis 3–5-floris constante, pedicellis brevibus crassis, bracteis 1–3-pollicaribus subulato-lanceolatis bracteolisque minoribus brunneis membranaceis, floribus 2–2¼ poll. longis erectis, ovario fusiformi terete saturate viridi, perianthii segmentis ovario paullo brevioribus lineari-oblongis obtusis medio crasse coriaceis dorso viridibus sanguineo punctatis marginibus membranaceis, filamentis segmentis fere duplo longioribus robustis pallide viridibus, antheris magnis ½ poll. longis viridibus, stylo robusto filamentis longiore, stigmate clavato.

A. Peacockii, *Croucher in Gard. Chron.* 1873, p. 1400, fig. 283. *Baker, Handb. Amaryll.* p. 171.

The flowering of a previously unfigured *Agave* is a satisfactory event, because without good figures made from specimens in a flowering condition, the determination by descriptions alone of the species of this large and economically important genus is never satisfactory. As regards *A. Peacockii* such a figure was especially needed, for the original description, made from a young flowerless specimen, is quite insufficient for the identification of the species. Fortunately there can be no doubt as to the *Agave* here figured being that to which the name *Peacockii* is given, for it is the type specimen purchased by the Royal Gardens at the sale in 1889 of the rich collection of Succulents formed by the late Mr. Peacock, of Hammersmith. It flowered in the Palm House of the Royal Gardens in December, 1899, having thrown up a scape which, with the inflorescence, was fourteen and

a half feet high. It is a native of the province of Tehuacan, in Central Mexico, whence it was imported by Mr. Roezl.

Descr.—Stemless. *Leaves* densely rosulate, forming a sub-hemispheric cluster nearly four feet in diameter, the outermost spreading horizontally, the innermost erect, all about two feet long by four inches broad above the middle, oblong-ensiform or oblanceolate, contracted above the base, terminated by a rigid brown, strict spine an inch long, thickly fleshy, strict, rigid, slightly convex above, more so beneath; upper surface very dark green, paler towards the centre; margins not cartilaginous in an old state, beset rather distantly and irregularly with unequal, short, brown spines, the largest of which consist of an elongate base, sometimes half an inch long, suddenly contracted into an incurved, pungent tip. *Scape* with the very narrow, spiciform panicle, fourteen and a half feet high, strict, erect, clothed below with distant subulate-lanceolate bracts. *Inflorescence* of innumerable very short, stout, sub-erect, green, bracteate peduncles, bearing clusters of three to five bracteolate, shortly, stoutly pedicelled, sub-erect, green flowers two to two and a half inches long. *Bracts* one to three inches long, and smaller bracteoles subulate-lanceolate, membranous, brown. *Ovary* fusiformly cylindric, green, smooth. *Perianth-segments* not as long as the ovary, linear-oblong, obtuse, thickly fleshy, green with blood-red spots, margins rather broadly winged, membranous, pale green. *Filaments* about twice as long as the perianth, very stout, erect; anthers half an inch long. *Style* rather longer than the stamens, stigma clavate. —*J. D. H.*

Fig. 1, upper third of leaf; 2, cluster of flowers, both of *nat. size*; 3, leaf half *nat. size*; 4 and 5, stamens; 6, tip of style and stigma:—*All enlarged*; 7, figure of whole plant $\frac{1}{15}$th of *nat. size*.

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M. S. del, J. N. Fitch lith.

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Tab. 7758.

NEILLIA Torreyi.

Native of the Rocky Mountains.

Nat. Ord. Rosaceæ.—Tribe Spiræeæ.

Genus Neillia, D. *Don*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 612.)

Neillia (Physocarpus) *Torreyi*; frutex humilis, ramis robustis cortice nigro tectis, foliis ad $1\frac{1}{2}$ poll. latis breviter petiolatis orbiculari-ovatis apice rotundatis basi profunde cordatis breviter trilobis crenulatis glabris vel sparse puberulis supra saturate viridibus nervis impressis subtus pallidis nervis prominulis, stipulis linearibus petiolo paullo brevioribus, floribus in corymbos fere globosos terminales breviter pedunculatos congestis brevissime pedicellatis, calycis stellato-tomentosi tubo hemispherico lobis ovatis obtusis intus glabris, petalis orbicularibus calycis lobos vix superantibus, staminibus ad 30 triseriatis petalis brevioribus, carpellis 2 stipite brevi insidentibus stellato-tomentosis connatis apicibus liberis in stylos filiformes attenuatis, maturis coriaceis ventro dehiscentibus, oligospermis, seminibus obovoideo-oblongis, testa pallida nitida.

N. Torreyi, *S. Wats. in Proc. Am. Acad.* vol. xi. (1876) p. 136. *Brew. & Wats. in Bot. Calif.* vol. i. p. 171 in note.

N. malvacea, *Greene in Pittonia*, vol. ii. (1889) p. 30.

N. monogyna, *var.* malvacea, *Jones in Zoe*, vol. iv. (1893-4) p. 43.

Spiræa monogyna, *Torrey in Ann. Lyc. N. York*, vol. ii. (1828) p. 194. *Eaton & Wright, N. Am. Bot.* p. 441.

S. opulifolia, var. γ. *Hook. Fl. Bor. Am.* vol. i. p. 171. *Torr. & Gray, Fl. N. Am.* vol. i. p. 414. *Porter, Fl. Colorado*, p. 33 (var. parvifolia.)

S. pauciflora, *Nutt. in Torr. & Gr. l.c.*

Physocarpus Torreyi, *Maxim. in Act. Hort. Petrop.* vol. vi. (1879) p. 221. *Coulter, Man. Bot. Rocky Mount.*, p. 78. *S. Wats. in Bot. Calif.* vol. ii. p. 443.

Opulaster malvacea, *O. Kuntze, Rev. Gen.* vol. ii. p. 949.

Epicostorus montanus, *Rafin. Atlant. Journ.* 1832, p. 144.

Neillia Torreyi ranges over a considerable area of North America, from British Columbia, along the Rocky Mountain region, at elevations of six thousand ft. to ten thousand ft., to New Mexico. I collected it when travelling with Dr. Gray in 1879, at La Veta, in Colorado, at above nine thousand ft. elevation. It forms, with other American species and a Manchurian (*N. amurensis*) a very distinct section of *Neillia* with corymbose flowers and other characters, regarded as a genus and named *Physocarpa* by Rafinesque, altered to *Physocarpus* and retained as a genus by Maximovicz and others.

February 1st, 1901.

A plant of *N. Torreyi* was received by the Royal Gardens, Kew, in 1897, from Professor Sargent, of the Arnold Arboretum, near Boston, which now forms a bush about three feet high, which flowered in the Arboretum in July, 1900.

Descr.—A robust shrub; bark black. *Leaves* one to one and a half inches long, orbicular-ovate, shallowly three-lobed, lobes and tip rounded, crenate, base deeply cordate, sinus narrow, sparsely stellately pubescent, dark green above, with deeply impressed nerves, pale beneath, with prominent nerves; petiole much shorter than the blade. *Stipules* linear, nearly as long as the petiole. *Flowers* about half an inch broad, in dense, terminal, shortly peduncled corymbs, one to one and a half inches in diameter, shortly pedicelled, white. *Calyx* stellately tomentose; tube hemispheric; lobes ovate, obtuse, glabrous within. *Petals* orbicular, as long as the calyx-lobes. *Stamens* about thirty, triseriate. *Carpels* two, on a short stipes, turgidly oblong, united at their ventral sutures to above the middle, narrowed into filiform styles, mature dehiscing. *Seeds* not numerous, obovoid, pale, smooth, polished.—*J. D. H.*

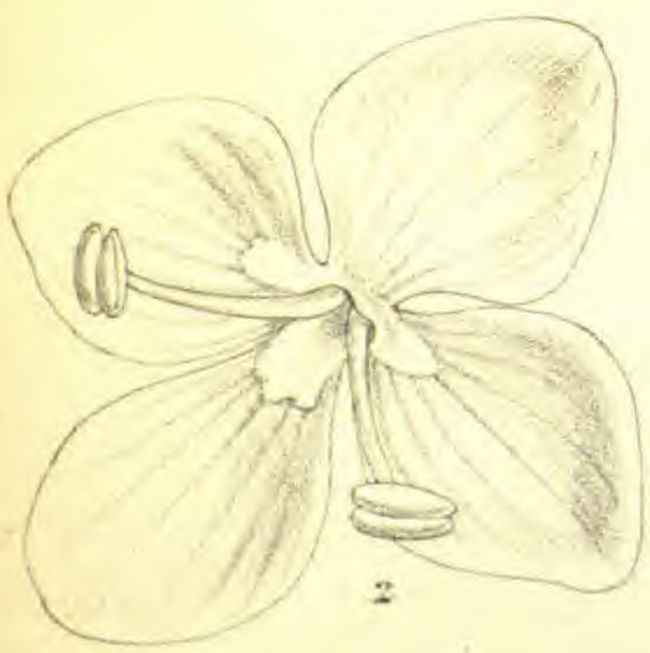
Fig. 1, unexpanded flower; 2, section of calyx with stamens and carpels; 3, ripe carpels; 4, stellate hairs of the flowers; 5, seeds:—*all enlarged.*

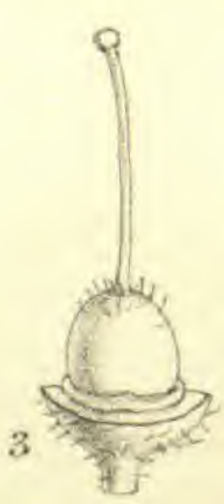
Postscript.—As this sheet was passing through the press I received from my friend Mr. B. L. Robinson, Keeper of the Gray Herbarium, Harvard University, U.S.A., to whom I had applied for information as to the specific validity of *N. malvacea* as distinct from *N. Torreyi*, a note to the effect, that "though the distinctions between them do not sound very strong, there seems to be little difficulty in distinguishing them." The characters of each which he gives me are:—

N. malvacea; carpels 2–3, leaves finely pubescent upon both surfaces, usually becoming tawny in drying.

N. Torreyi; carpels 1–2, leaves smaller, essentially glabrous. Mr. Robinson adds that the two forms have a pretty definite range, *N. malvacea*, from Oregon and the northern Rocky Mountains, Washington, and Idaho, to Utah, Nevada and Western Texas; *N. Torreyi* from S. Dakota, Wyoming, and the Rocky Mountains of Colorado, to New Mexico.

From this it may be concluded that the figure here given is of the form *N. malvacea*, though the leaves are glabrous above and only very sparsely puberulous with deciduous hairs beneath.—J.D.H., *January 25th*, 1901.





del. J.N. Fitch 1861.

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TAB. 7759.

VERONICA GLAUCA.

Native of Greece.

Nat. Ord. SCROPHULARINEÆ.—Tribe DIGITALEÆ.

Genus VERONICA, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 964.)

VERONICA (Veronicastrum) *glauca*; annua, suberecta, ramosa, caule ramisque oppositis gracilibus subbifariam laxe pubescentibus, foliis breviter petiolatis late ovatis obtusis crenato-dentatis basi rotundatis vel subcordatis supra glabris subtus pilosulis, floralibus bracteiformibus parvis angustis 2–3-lobatis supremis integris, racemis laxifloris, pedicellis filiformibus calyce 3–5-plo longioribus fructiferis patulis apice recurvis, calycis segmentis ellipticis obtusis pubescentibus paribus valde inæqualibus longioribus corolla brevioribus, corollæ lobis subæqualibus cæruleis basi albis, capsula orbiculata truncato-subretusa glabra v. parce pilosa, loculis 6–7-spermis, seminibus cyathiformibus concavo-convexis.

V. glauca, *Sibth. & Sm. Fl. Græc.* i. p. 6, t. 7. *Benth. in DC. Prodr.* vol. x. p. 484. *Boiss. Fl. Orient.* vol. iv. p. 461.

V. græca, *Sprun. Pl. Græc. exsicc. ex Boiss. l.c.*

V. amœna, *Heldr. Herb. Norm. ex Nym. Consp.* p. 548, *non Stev.*

Bentham, in De Candolle's "Prodromus," doubts *V. glauca* being specifically distinct from *V. amœna*, Bieb. This arises from imperfect knowledge of the latter plant, which he confounds with *V. græca*, Sprun., and hence erroneously describes it as having pedicels twice or thrice as long as the calyx. The fact is that *V. græca* is a synonym of *V. glauca*. *V. amœna* has very short pedicels, and further differs from *V. glauca* in its small size (two to three inches high), glandular hairs, lanceolate sepals, and native country (Armenia). *V. peduncularis*, Bory & Chaub. (non Bieb.), also cited in the "Prodromus" under *V. amœna*, differs both from that plant and from *V. glauca* in the glabrous capsule two-lobed to the middle.

Veronica glauca is a native of sandy fields in Attica, where it was discovered by Sibthorp, on Mount Hymettus, near Athens, and it has also been collected in Crete. The specimen figured here was raised from seeds presented to the Royal Gardens, Kew, by the Hon. Charles Ellis, of Frensham Hall. It flowered in June in the Herbaceous ground, and is an annual. The flowers are smaller than

in the native specimens, in which, according to Boissier, the corolla is three times as long as the calyx.

Descr.—A slender, much-branched annual, branches opposite, loosely subifariously pubescent. *Leaves* one half to three-fourths of an inch long, shortly petioled, broadly ovate, obtuse, crenate-toothed, glabrous above, puberulous beneath; floral bracteiform, smaller, narrower, two to three-lobed, uppermost entire. *Pedicels* half to one inch long, very slender, fruiting spreading, tips recurved. *Calyx* one-third to half an inch long, pubescent, divided to the base into two very unequal elliptic pairs of segments. *Corolla* three-fourths of an inch in diameter; lobes bright blue, white at the base, three upper orbicular-ovate, lower rather longer, spathulately obovate. *Filaments* shorter than the corolla-lobes. *Capsule* sub-orbicular, retusely truncate. *Seeds* concavo-convex.—*J. D. H.*

Fig. 1, calyx; 2, corolla and stamens; 3, ovary; 4, capsule:—*All enlarged.*

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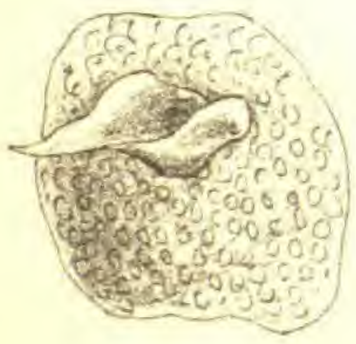

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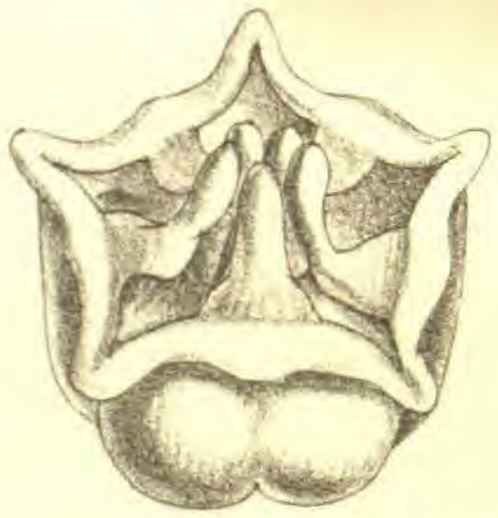

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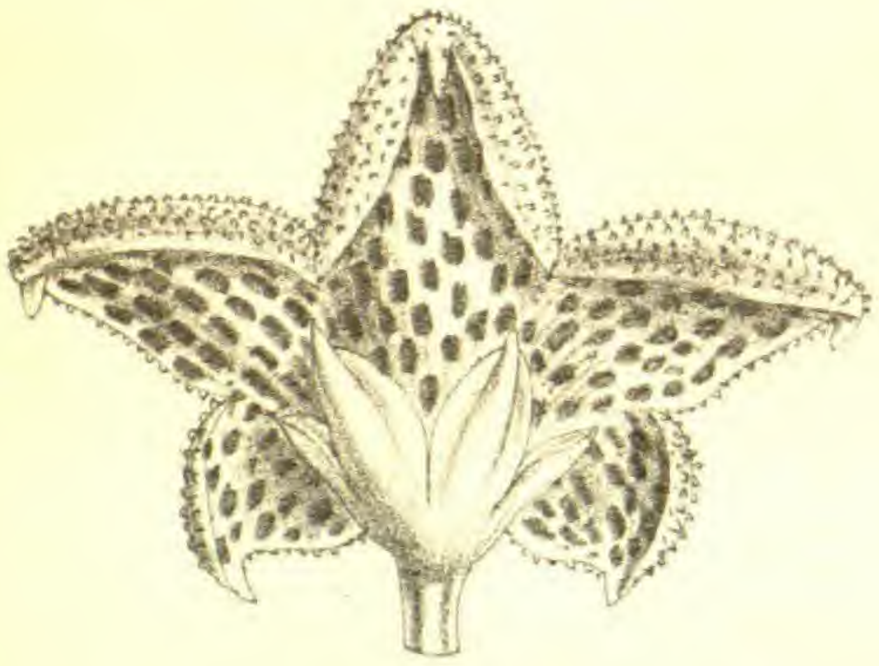

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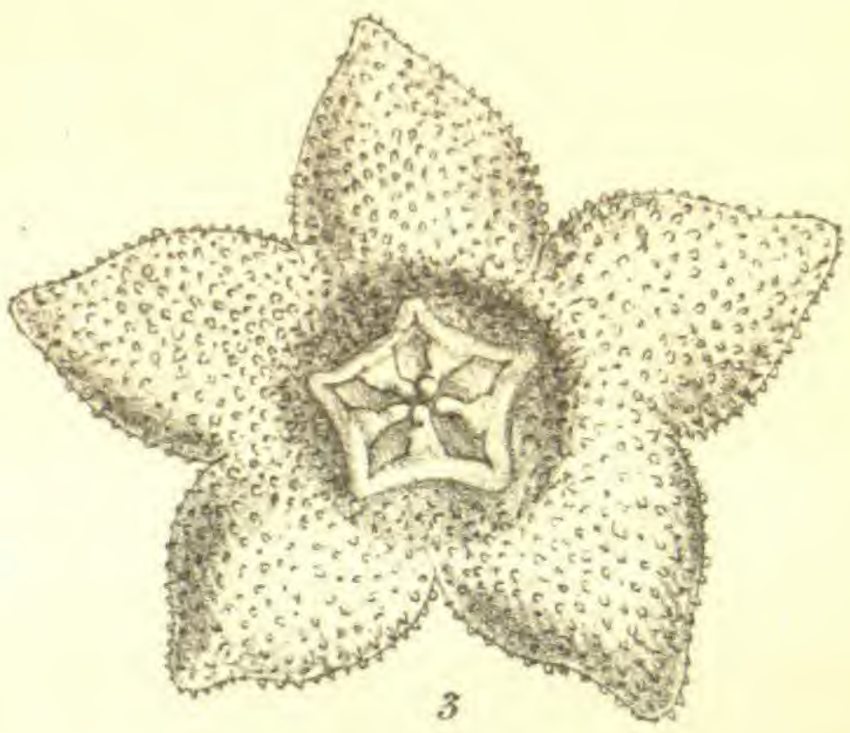

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Tab. 7760.

ECHIDNOPSIS Bentii.

Native of Southern Arabia.

Nat. Ord. Asclepiadeæ.—Tribe Ceropegieæ.

Genus Echidnopsis, *Hook. f.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 781)

Echidnopsis, *Bentii*; caulibus fuscis 7–8-costatis costis mamillatis, mamillis uniseriatis folio minuto ovato cuspidato concavo coronatis, floribus apices versus ramorum binis breviter pedicellatis, calycis segmentis deltoideo-ovatis glabris, corolla vix ½ poll. diam. extus viridi-purpureo maculata intus velutina saturate purpurea, tubo brevi campanulata, limbi patentis lobis late ovatis apiculatis marginibus revolutis, corona exteriore cupulari pentagona truncata purpurea angulis acutis parum productis, interioris lobis erecto-conniventibus breviter clavatis obtusis basi fundo exterioris adnatis.

E. Bentii, *N. E. Brown in Kew Bulletin, ined.*

The genus *Echidnopsis* was established in this Magazine, tab. 5930, on a South African species, *E. cereiformis*, of the same habit as *E. Bentii*, but much larger, of a bright green colour, with yellow flowers. Recently other species have been added to the genus, one of which, *E. Dammanniana*, a native of Arabia, is, according to Mr. N. E. Brown, closely allied to *E. Bentii*, differing in the corona.

E. Bentii was found in Southern Arabia, the exact locality unknown, by the intrepid traveller whose name it bears. It was sent to Kew by him shortly before his death, together with fragments of other plants collected during his last expedition, probably in the Hadramaut district, to the East of Aden. It flowered in a warm house of the Royal Gardens, Kew, in June, 1899.

Descr.—Whole plant at present five to six inches high, consisting of a short stem, with ascending branches of a pale brown colour. Stem and branches one-half to three-quarters of an inch in diameter, the latter narrowing upwards, seven to eight-ribbed, each rib consisting of a single series of mamillæ, each of which is crowned by a minute, ovate, concave, cuspidate leaf, about one-twentieth of an inch long. *Flowers* in pairs towards the tips of the branches, very shortly pedicelled, half an inch in diameter. *Calyx-segments* ovate-lanceolate, acute. *Corolla* with a

short, campanulate tube, and five spreading lobes, externally green, spotted with purple, internally velvety, of a rich, deep, vinous-purple colour; lobes ovate, apiculate, margins revolute. *Outer corona* cupular, acutely five-angled, truncate, purple; inner of five erect and conniving, shortly clavate lobes, which are adnate at the base to the base of the outer corona.—*J. D. H.*

Fig. 1, portion of a mamilla and leaf; 2, back, and 3, front view of flower; 4, corona; 5, pollinia :—*All enlarged.*

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Tab. 7761.

ROSA Seraphini.

Native of Italy.

Nat. Ord. Rosaceæ.—Tribe Roseæ.

Genus Rosa, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 625.)

Rosa (Rubiginosæ) *Seraphini*; frutex humilis, erectus, ramosissimus, ramis ramulisque crebre armatis, aculeis inæqualibus falcato-decurvis compressis basi dilatatis, foliis 1–2 poll. longis, petiolo brevi rhachique gracili, foliolis 7 parvis orbicularibus late ovatisve glanduloso-dentatis supra saturate viridibus, subtus pallidis glandulis inter nervos paucis, stipulis linearibus acuminatis, floribus solitariis ad 1¼ poll. diam., pedunculo brevi tuboque calycis ellipsoideo glaberrimis, sepalis petalis paullo brevioribus patentibus parce glandulosis post anthesim reflexis appendicibus anguste oblongo-lanceolatis, petalis læte roseis, ovariis sericeo-pilosis pisiformibus rubris demum nigris sepalis persistentibus coronatis.

R. Seraphini, *Viviani, Fl. Corsic. Sp. Nov.* p. 8; *Fl. Lyb. Spec.* p. 67 (*Serafini*). *Bertol. Fl. Ital.* vol. v. p. 194. *DC. Prodr.* vol. ii. p. 625 (*Serafinii*). *Gussone Fl. Sic. Prodr.* vol. i. p. 574; *Fl. Sic. Synop.* i. p. 564. *Moris, Fl. Sardoa.* vol. ii. p. 40. *Arcang. Compend. Fl. Ital.* p. 226. *Crepin in Compt. Rend. Soc. Roy. Bot. Belg.* 1892, p. 88. *Pojero, Fl. Sic.* vol. i. pars II. p. 187.

R. apennina, *Woods, Tourist's Flora*, p. 123.

R. cretica, *var.* Serafini, *Wallr. Ros. Pl. Gen.* p. 145.

R. glutinosæ, *Sibth. & Sm. forma, Parlat. Fl. Ital.* vol. x. p. 26.

R. graveolens, *var.* γ. corsica, *Gren. & Godr. Fl. Fr.* vol. i. p. 561.

R. parvifolia, *Sanguin. Cent. Fl. Rom.* p. 70 (*ex Moris, l.c.*).

R. Seraphini is a dwarf rose of peculiar habit, closely allied to *R. agrestis*, Savi, which differs from it in habit, in the leaves narrowed to the tip, with many glands beneath, and in the eglandular reflexed caducous sepals. It was published as *Seraphini* and *Serafini* in the same year by its author, of which names the former is that usually adopted, though, according to a note by J. Gay in the Kew Herbarium, Serafino is that of the botanist after whom the species is named. The habitats recorded for it by Arcangeli are stony places above one thousand six hundred ft. elevation in the Apuan Alps, Corsica, Sardinia, and Sicily; and, for two varieties, the Maritime Alps.

The specimen figured is from a plant raised from seed received at the Royal Gardens, Kew, in 1894, from the

Innsbrück Botanical Gardens, which flowered in June, 1900, in the Arboretum, it being then a foot high.

Descr.—A low, densely branching and leafing bush, with spreading or deflexed branches, closely covered with unequal, hooked, flattened prickles. *Leaves* one and a half to two inches long; petiole and rhachis slender; leaflets seven, orbicular, or very broadly ovate, tip rounded or acute, acutely toothed, lateral about half an inch long, terminal larger, all dark green, sparsely glandular beneath; stipules narrow, acuminate. *Flowers* solitary, shortly peduncled, about an inch and a quarter in diameter; peduncle and ellipsoid calyx-tube quite smooth. *Sepals* rather shorter than the bright, rose-coloured petals, margins sparsely glandular; appendices oblong-lanceolate. *Fruit* pisiform, red, at length black, crowned with the persistent sepals.—*J. D. H.*

Fig. 1, leaflet; 2, unexpanded flower; 3 and 4, stamens; 5, ovary:—*All enlarged.*

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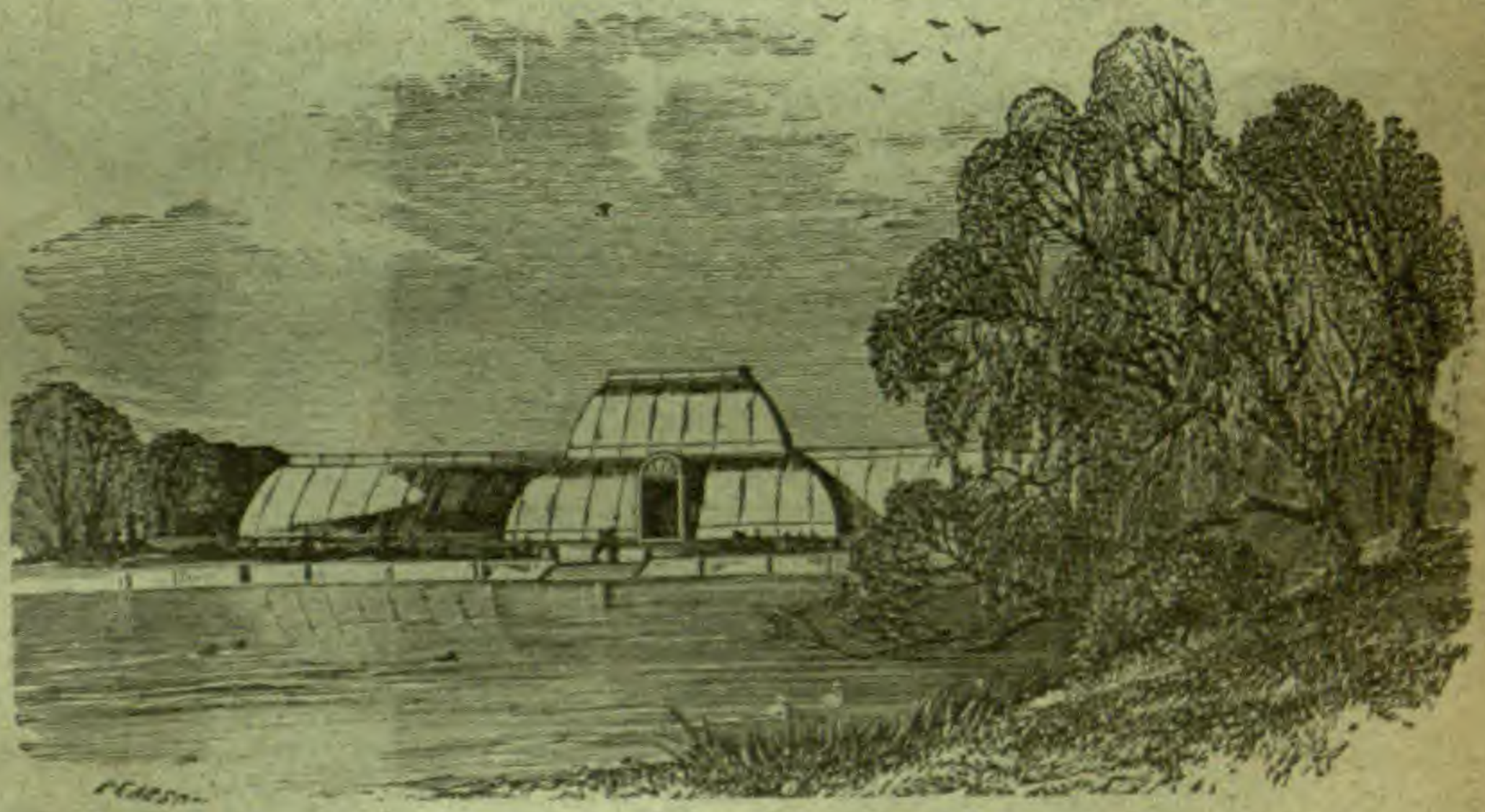

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Tab. 7762.

HYMENOCALLIS schizostephana.

Native of Brazil.

Nat. Ord. Amaryllideæ.—Tribe Amaryllæ.

Genus Hymenocallis, *Salisb.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 734.)

Hymenocallis *schizostephana*; bulbo ovoideo, foliis ad 8 distichis oblongo-lanceolatis 1–1½ ped. longis 2½–3½ poll. latis in petiolum latum concavum angustatis læte viridibus costa subtus crassa, nervis numerosis nervulis oblique trabeculatis, scapo terminali ultrapedali valido compresso pallide viridi, umbella multiflora, spathis extimis 8–10 lineari-lanceolatis obtusis 1–2 poll. longis membranaceis albis, interioribus paucis æquilongis linearibus, floribus sessilibus, perianthii tubo 2–2½-pollicari viridi, segmentis 3-pollicaribus loriformibus albis, staminum corona ½ poll. longa infundibulari 6-fida v. -partita, lobis edentatis, filamentis gracilibus, antheris linearibus ½ poll. longis, stigmate capitellato.

H. schizostephana, *Worsley in Gard. Chron.* 1899, vol. i. p. 386.

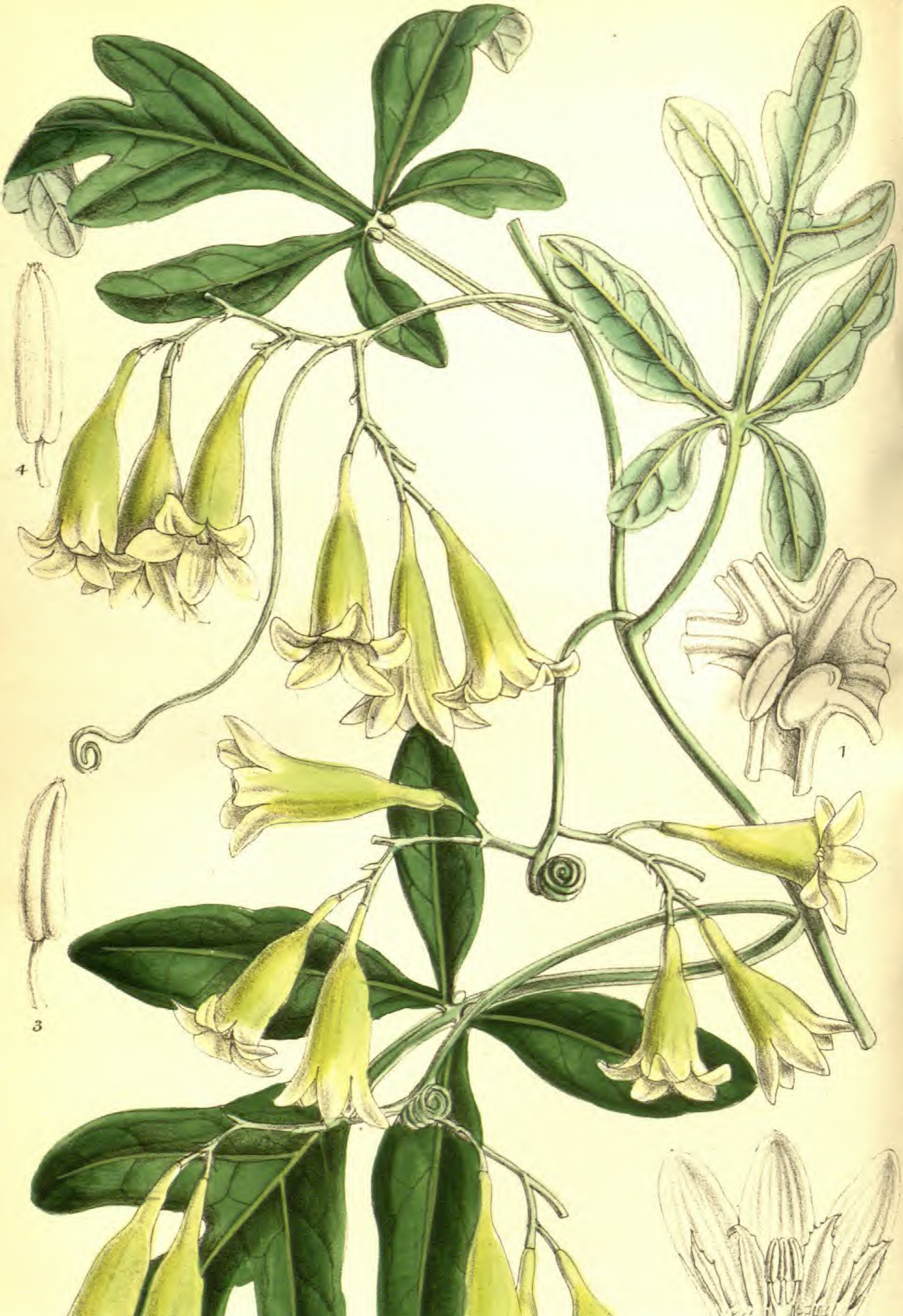
A very distinct species of a genus numbering upwards of thirty species, natives of the New World, and chiefly tropical. It is a near ally of *H. tubiflora*, Salisb. (Pancratium guianense, *Gawl. in Bot. Reg.* t. 265), a native of Demerara, from which it differs in the paler leaves with trabeculate nervation, in the compressed not two-edged scape, in the more numerous, shorter, white spathe-valves, in the much shorter perianth-tube and segments, and in the shorter six-fid or six-partite corona. It is also closely allied to *H. angustum*, Herb. (Pancratium angustum, *Gawl. in Bot. Reg.* t. 221, referred to *H. caribæa*, Herb., by Baker), in which the corona has triangular lobes between the stamens, and which has more slender filaments, a shorter perianth-tube, and narrower perianth-segments.

A bulb of *H. schizostephana* was presented to the Royal Gardens, Kew, by A. Worsley, Esq., of Mandeville House, Isleworth, the possessor of a fine collection of bulbous plants and of drawings of the same. It flowered in a warm greenhouse in June, 1899. The flowers are fragrant.

Descr.—*Bulb* ovoid. *Leaves* about eight, distichous, twelve to eighteen inches long by two and a half to three and a half inches broad, oblong-lanceolate, narrowed into

a broad petiole; nerves trabeculate. *Scape* about a foot high, stout, compressed. *Umbel* many-fld.; outer spathes eight to ten, one to two inches long, linear-lanceolate, obtuse; inner as long, narrower; flowers sessile. *Perianth-tube* two to two and a half inches long, green; segments rather longer, loriform, white. *Staminal* crown infundibular, half an inch long, six-fid or -partite, edentate; filaments slender; anthers linear. *Stigma* capitellate.—*J. D. H.*

Fig. 1, staminal crown; 2 and 3, anthers; 4, top of style and stigma:—*all enlarged*; 5, reduced view of whole plant.



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Tab. 7763.

MODECCA senensis.

Native of Mozambique and Delagoa Bay.

Nat. Ord. Passifloreæ.—Tribe Modeccæ.

Genus Modecca, *Lam.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 813.)

Modecca (Microblepharis) *senensis*; glaberrima, caule gracili ramoso scandente tereti, foliis ambitu late ovatis palmatim 5-partitis supra saturate viridibus subtus glaucis, segmentis lateralibus paribus oppositis dispositis sessilibus lineari-oblongis obtusis integerrimis, terminali majore trilobo basi cuneato in petiolulum canaliculatum angustato lobis oblongis obtusis, petiolo lamina breviore canaliculato apice utrinque glandula magna instructo, stipulis minutis subulatis caducis, cymis axillaribus dichotomis laxifloris cirrhiferis, bracteis minutis sparsis, floribus masc. pollicaribus, calyce anguste campanulato in pedicellum brevem articulatum attenuato stramineo breviter 5-lobo basi intus puberulo et glandulis 5 stipitatis ornato, lobis ovato-oblongis obtusis recurvis, petalis medio tubi insertis parvis lineari-oblongis inclusis, filamentis in tubum apice 5-fidum connatis, antheris lineari-oblongis.

M. senensis, *Mast. in Oliv. Fl. Trop. Afr.* vol. ii. p. 513.

Clemanthus senensis, *Klotzsch in Peters Naturwiss. Reise in Mossambiq. Bot.* p. 143.

Modecca is a genus of tropical African Asiatic, and Australian plants, containing nearly forty known species. It is almost unknown in cultivation, only one having hitherto been figured in any English Horticultural work, the *M. lobata*, Jacq. (Bot. Reg. t. 433), also a tropical African species. All are unisexual climbers.

M. senensis was discovered in Mozambique by the late Professor Peters, of Berlin, when engaged in his scientific exploration of that unhealthy district. More recently it has been found at Delagoa Bay, whence seeds were sent to the Royal Gardens, Kew, in 1884, by Mrs. Monteiro, from which plants were raised that flowered in 1899. The specimen from which the figure is taken is that of a male plant which climbs the rafters of the Succulent House of the Royal Gardens, Kew. The flowers are fragrant.

Descr.—A tall, slender, perfectly glabrous, rather glaucous climber. *Stem* and *branches* terete. *Leaves* broadly ovate in circumscription, three to four inches long, palmately five-partite, pale green, glaucous beneath; lateral segments in opposite pairs, sessile, linear-oblong,

obtuse, quite entire, the basal pair smallest; terminal segment much larger, three-lobed, base cuneate, narrowed into a channelled petiolule; lobes oblong, tips rounded; petiole shorter than the leaf, deeply channelled in front, and with two large, oblong glands, one on each side of the apex. *Cymes* axillary, dichotomous, few-fld., with a slender tendril in the fork. *Male flowers* shortly pedicelled, an inch long. *Calyx* narrowly campanulate, pale yellow, five-lobed; lobes spreading and recurved, ovate, sub-acute; tube pubescent within, and with stipitate glands at the very base. *Petals* very small, linear-oblong, inserted half way down the tube of the calyx. *Filaments* united in a slender tube, bearing five linear anthers.—*J. D. H.*

Fig. 1, base of leaf and apex of petiole showing the glands; 2, vertical section of male flower; 3 and 4, stamens:—*all enlarged.*

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Tab. 7764.

Cœlogyne Veitchii.

Native of New Guinea.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Cœlogyne, *Lindl.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 518).

Cœlogyne (Eucœlogyne) *Veitchii*; pseudobulbis fasciculatis 3–4-pollicaribus oblongo-fusiformibus nudis profunde sulcatis demum alte costatis diphyllis, surculis vaginis brunneis tectis, foliis 5–9-pollicaribus elliptico-lanceolatis acutis subcoriaceis 3-nerviis supra saturate viridibus basi in petiolum brevem brunneum angustatis, scapo basi vaginato cum racemo laxe multifloro pendulo 1–2-pedali, rhachi gracili, bracteis $\frac{1}{2}$–$\frac{3}{4}$ poll. longis oblongis acutis convolutis brunneis diu persistentibus, pedicellis cum ovario bracteis æquilongis, perianthio subgloboso $\frac{2}{3}$ poll. diam. albo, sepalis petalisque erectis concavis incurvis, sepalo postico oblongo-lanceolato acuto lateralibus connatis, petalis sepalis minoribus lanceolatis demum reflexis, labello sepalis paullo longiore trilobo basi rotundato lobis lateralibus obtusis columnam velantibus terminale late ovato acuto revoluto, disco basi 3-carinato, columna brevi apice dilatata et crenata.

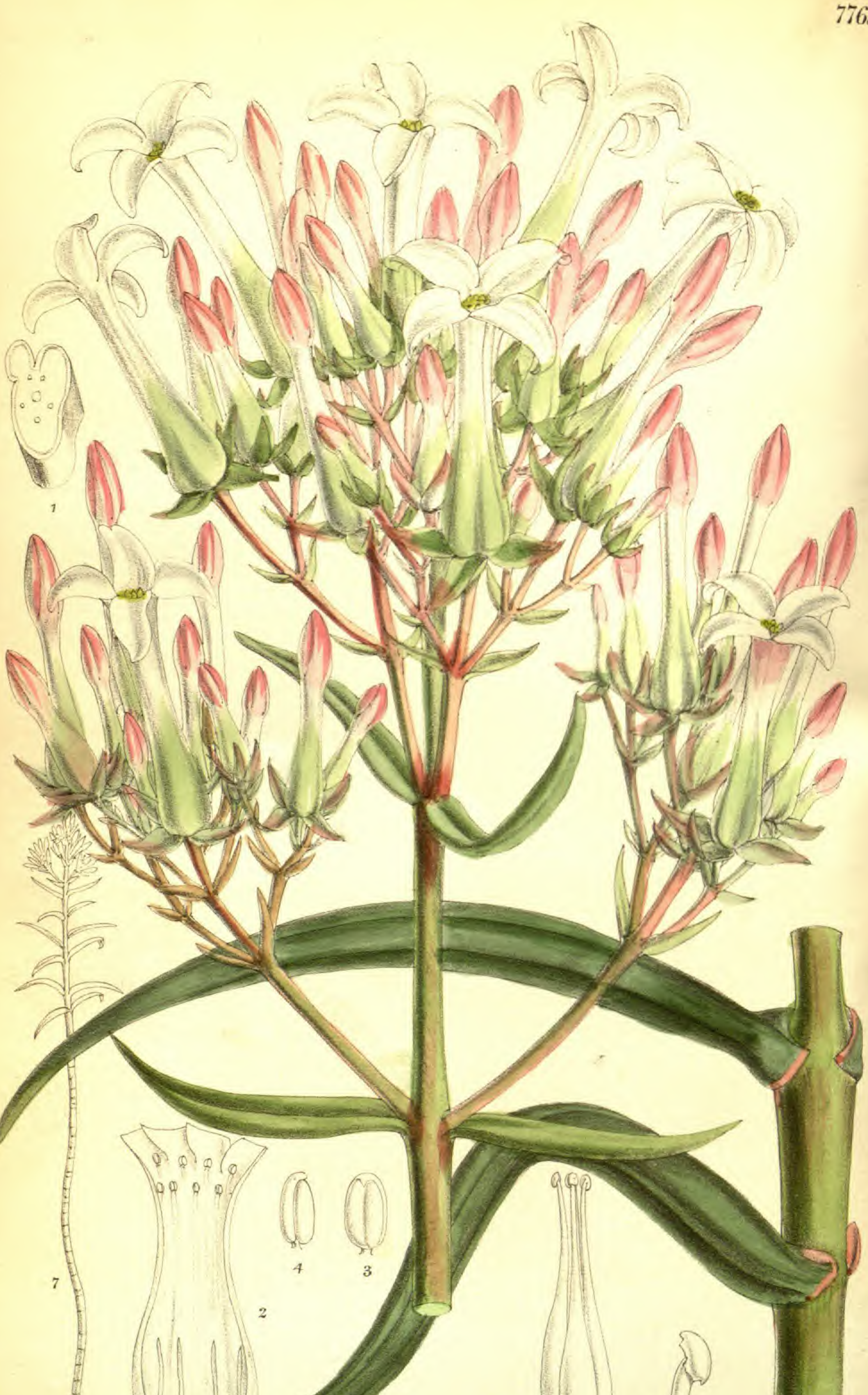
C. Veitchii, *Rolfe in Kew Bulletin*, 1895, p. 282.

A very distinct species of a genus of which nearly a hundred species are now known. Mr. Rolfe indicates the absence of markings on the lip, which bears three rather obscure basal keels, and the short column as characters quite different from those of any known congeners. It was introduced from western New Guinea by Mr. Burke, collector for Messrs. Veitch & Sons, who presented the specimen here figured to the Royal Gardens, Kew, where it flowered in a hot-house in August, 1900. The anthers bore no pollinia.

Descr.—*Pseudobulbs* three to four inches long, oblong-fusiform, green, naked, when old deeply grooved and strongly ribbed, two-leaved, emitting from the base stout surculi, clothed with red-brown imbricating scales. *Leaves* five to nine inches long, elliptic-lanceolate, acute, rather coriaceous, narrowed at the base into a stout brown petiole, dark green above, with three impressed nerves, paler and three-ribbed beneath. *Raceme* terminal, pendulous, with the scape one to two feet long, laxly many-flowered; rhachis slender. *Pedicels* with the ovary one

half to three-fourths of an inch long, slender. *Bracts* as long, oblong, acute, convolute, pale red-brown, very persistent. *Perianth* white, nearly globose, the sepals and petals being incurved and dorsally very convex, about two-thirds of an inch in diameter. *Sepals* oblong-lanceolate, acute; lateral connate. *Petals* smaller than the sepals, lanceolate, acuminate, at length recurved. *Lip* rather longer than the sepals, three-lobed; base rounded, hardly saccate; lateral lobes concealing the column, obtuse; terminal short, very broadly ovate, revolute, disk with three obscure basal keels. *Column* short, with an orbicular, dilated, crenate summit.—*J. D. H.*

Fig. 1, lip; 2, column; 3, anther:—*all enlarged.*



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Tab. 7765.

KALANCHOE Bentii.

Native of Southern Arabia.

Nat. Ord. Crassulaceæ.

Genus Kalanchoe, *Adans.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 659.)

Kalanchoe *Bentii*; frutex erectus, glaberrimus, caule elongato simplici tereti foliisque fusco-viridibus, foliis glaucis decussatim oppositis sessilibus 3–6-poll. longis patenti-recurvis pugioniformibus crasse carnosis a latere compressis dorso rotundatis facie sulcatis ima basi tumidis semi-amplexicaulibus medio ad ½ poll. latis dein sensim ad apicem acutam attenuatis, paniculæ ramulis subcorymbosis multifloris, bracteis bracteolisque angustis carnosis, floribus erectis pedicellatis, sepalis 4 patulis ovato-lanceolatis ¼–½ poll. longis carnosulis luride viridibus, corollæ albæ tubo 1½ poll. longo subtetragono a basi tumido virescente ⅓ poll. diam. sensim attenuato, limbi lobis ½ poll. longis patenti-recurvis ovatis albis intus papillosis alabastro roseis, disci squamulis filiformibus, antheris minutis oblongis, carpellis angustis in stylos graciles attenuatis.
K. Bentii, *C. H. Wright mss.*

Kalanchoe Bentii was raised from seeds collected by the late Mr. Theodore Bent in the Hadramaut district of Southern Arabia in 1894, and sent to the Royal Gardens, Kew. It flowered in June, 1900. As a species it differs from all others in the form of the leaves.

Descr.—*Stem* in the specimen figured quite simple, three feet high, erect, slender, one inch in diameter, scarred at the closely set internodes, leafy for the upper third, terete, smooth, dull olive-green; upper internodes about an inch long. *Leaves* decussately opposite, thickly fleshy, three to six inches long, spreading and recurved, dagger-shaped, gradually contracted from the middle to the tumid, sessile, semi-amplexicaul base, and to the acute tip, laterally compressed, about half an inch thick in the middle, dorsally rounded, deeply grooved on the upper surface, margins rounded, dirty olive-green in colour, and glaucous. *Panicle* erect, many-fld., eight inches high; rhachis, branches and branchlets erecto-patent, terete; pedicels short; bracts and bracteoles linear, fleshy. *Flowers* sub-corymbose on the branches of the panicle, erect, an inch and a half long, white, with pink unexpanded corolla-lobes. *Sepals* ovate-lanceolate, a quarter to half an inch long, spreading, olive-

green, fleshy. *Corolla-tube* obscurely four-angled, about one-sixth of an inch in diameter in the middle, gradually dilating downwards to the tumid base, which is one-third of an inch diam.; lobes ovate, half an inch long, spreading and recurved. *Anthers* minute. *Disc-scales* filiform. *Carpels* slender, narrowed into almost filiform, erect styles, with minute capitate stigmas.—*J. D. H.*

Fig. 1, transverse section of leaf; 2, corolla laid open; 3 and 4, anthers; 5, carpels; 6, stigmas:—*all enlarged*; 7, *reduced view* of whole plant.

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Tab. 7766.

MASDEVALLIA deorsum.

Native of New Grenada.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Masdevallia, *Ruiz & Pav.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 492.)

Masdevallia (Coriaceæ) *deorsum*; cæspitosa, acaulis, pendula, folio 10–13 pollicari oblanceolato obtuso coriaceo enervi medio sulcato supra viridi marginibus rufescentibus junioribus subtus rubro adspersis, pedunculo foliis breviore robusto pallido rubro-punctato medio vagina oblonga concolore instructo, perianthii aurei rubro maculati tubo brevi $\frac{1}{3}$ poll. diam. basi gibbo, sepalo dorsali reflexo e basi brevi late ovato repente in caudam $2\frac{1}{2}$ poll. longam constricto, lateralibus ovato-lanceolatis in caudas cauda dorsali breviores sensim angustatis, petalis parvis spathulato-obovatis pallidis, labello oblongo-obovato obtuso supra ultra medium papillis, elongatis sanguineis villoso, basin versus maculis luteis ornato.

M. deorsa, *Rolfe in Orchid Rev.* vol. viii. (1900) p. 255. *Gard. Chron.* 1900, vol. ii. p. 395, fig. 121, and p. 419.

A very remarkable species of a genus abounding in curious forms, distinguished from all others, in so far as at present known, by its strictly pendulous habit, likened by Mr. Rolfe to that of *Cattleya citrina*, Lindl. (tab. 3742). Several plants of it were imported from New Grenada in 1894 by Consul Lehmann, of Hamburg, of which two flowered in 1900, one at Glassnevin, with Mr. Frederick Moore, A.L.S.; the other in Sir Trevor Lawrence's unique Orchid collection at Burford Lodge, Boxhill. The figure here given is from the latter specimen, kindly forwarded to me by Sir Trevor for the purpose in November last.

Descr.—Whole plant pendulous, tufted. *Leaf* ten to thirteen inches long, oblanceolate, obtuse, coriaceous, bright green above, with pale rufous margins, when young copiously dotted beneath with red. *Peduncles* one-flowered, much shorter than the leaf, stout, sprinkled with red spots, bearing an appressed sheath about the middle. *Flower* very large, yellow, blotched with bright red. *Tube* of perianth one-third of an inch in diameter, base rounded. *Dorsal* sepal broadly ovate, very short, reflexed, suddenly contracted into a slender tail two and a half inches long. *Lateral* sepals ovate-lanceolate, an inch and a half long,

gradually narrowed into slender tails shorter than those of the dorsal sepal. *Petals* obovate-spathulate, obtuse, pale greenish-yellow. *Lip* obovate-oblong, densely villous from beyond the middle to the tip with blood-red, elongated papillæ.—*J. D. H.*

Fig. 1, petals and lip; 2, lip; 3, column; 4, anthers; 5 and 6, pollinia:—*all enlarged.*

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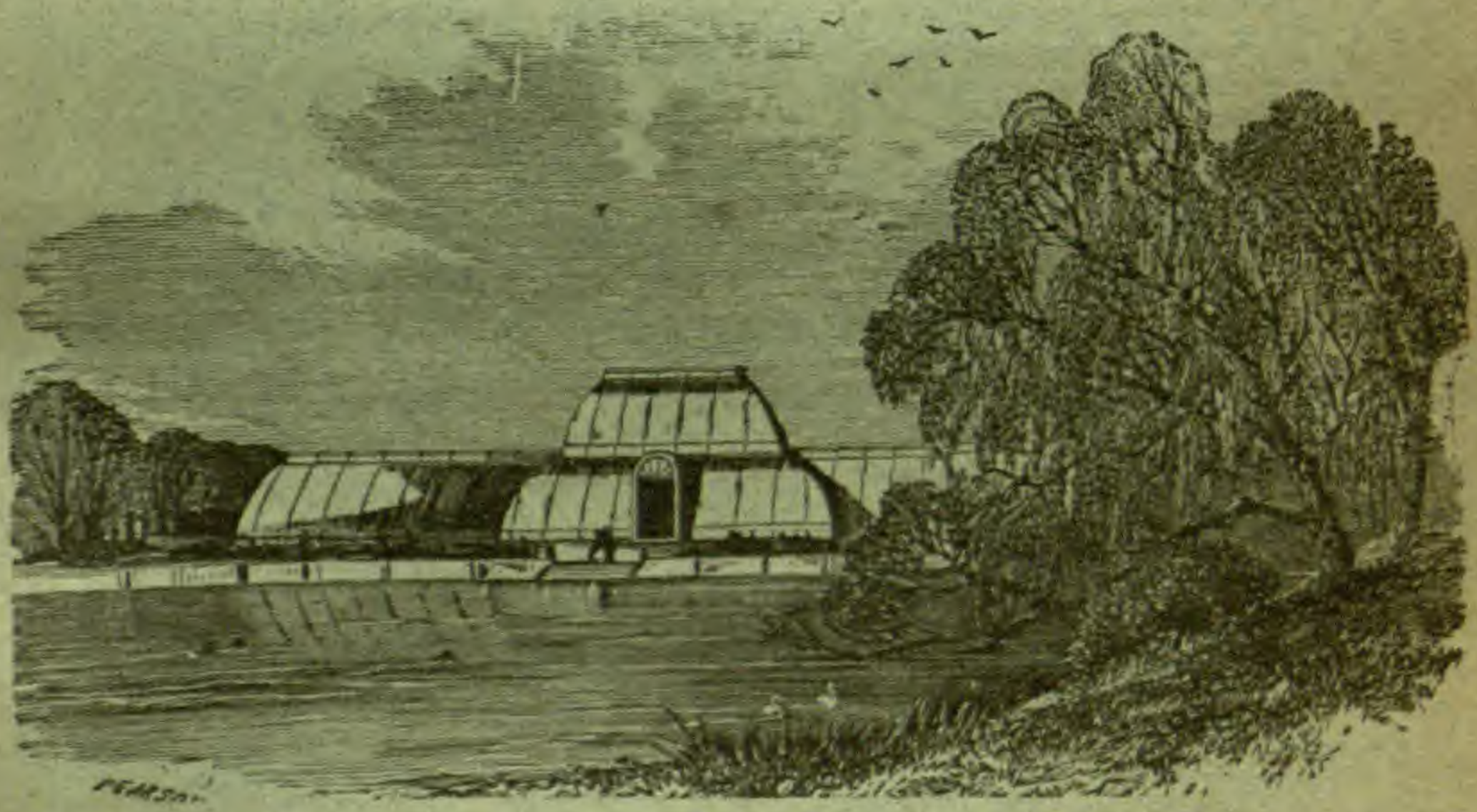

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Tab. 7767.

CLADRASTIS tinctoria.

Native of the Western United States.

Nat. Ord. Leguminosæ.—Tribe Sophoreæ.

Genus Cladrastis, *Raf.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 554.)

Cladrastis *tinctoria*; arbor 50–60-pedalis, fere omnino glabra, cortice lævi, ligno flavo, ramulis pendulis lenticellatis glabrescentibus, foliis impari-pinnatis 8–12 poll. longis, rhachi gracili basi tumido cavo alabastrum claudente, foliolis 7–13 ovatis oblongisve 3–4 poll. longis apice rotundatis basi acutis, stipulis obsoletis, racemis paniculisve terminalibus 12–14 poll. longis pendulis laxifloris, rhachi gracillimo, bracteis minutis caducis, floribus expansis ad 1 poll. longis pedicellatis albis, calyce 5-dentato, vexillo rotundato reflexo, alis oblique oblongis, carinæ petalis liberis dorso arcte imbricatis, staminibus fere liberis, legumine lineari plano-compresso, seminibus oblongis compressis estrophiolatis.

C. tinctoria, *Raf. Fl. Kent.* 1324 (*ex S. Wats. Bibl. Ind. N. Am. Bot.* p. 210); *Neogenyt.* (1825); *Med. Fl.* vol. ii. p. 210; *New. Fl. N. Am.* vol. iii. p. 83. *Torr. & Gr. Fl. N. Am.* vol. i. p. 391. *Chapman, Fl. S. U. St.* p. 113. *A. Gray Man. Bot. N. U. States*, Ed. 1880, p. 143.

C. lutea, *Koch, Dendrol.* vol. i. p. 6. *Sargent, Gard. & Forest*, vol. ii. p. 375; *Silv. N. Am.* vol. iii. p. 57, t. 119, 120.

Virgilia lutea, *Michx. fil. Hist. Arbr. Am. Sept.* vol. iii. p. 266, t. 3; *Pursh, Fl. Am. Sept.* p. 309. *Nutt. Gen. N. Am. Pl.* vol. i. p. 284. *Loisel. Herb. Gen. de l'Amat.* t. 197. *D.C. Prodr.* vol. ii. p. 98. *Spach. Hist. Veg.* vol. i. p. 163. *Eaton, Man. Bot. N. Am.* Ed. 6, p. 395. *Eaton & Wright, N. Am. Bot.* Ed. 8, p. 480. *Loud. Arboret. Brit.* vol. ii. p. 565.

Cladrastis tinctoria, the "yellow" or "Gopher" wood of N. America, is one of the rarest trees of the United States, being confined to the western bases of the Alleghany Mts. in Kentucky, Central Tennessee, and N. Carolina. It is remarkable for its silvery closely appressed bark, like that of the Beech, pendulous brittle branches, and profusion of delicately fragrant white flowers. Only two other species of the genus are known, *C. amurensis*, Benth. (see tab. 6551) a native of Manchuria, and *C. sinensis*, Helms., of China. It is remarkable as one of the most striking evidences of the affinity of the Flora of N.E. Asia with that of N.E. America (to the exclusion of both Japan and W. America). According to Eaton the bark yields a yellow dye. According to Loudon it was introduced into England in 1812 by John Lyon, a Scotchman, who

travelled in Carolina, Georgia, and Florida, returning twice to England with large contributions to our gardens. He died in 1818, in America.

The Gopher wood is not uncommon in plantations in various parts of Europe, flowering abundantly in the warmer climates, but rarely in the northern. There is a large tree of it in the Royal Gardens, Kew, which flowered in June, 1900, and from which the foliage and panicle of the accompanying figure was taken.

Descr.—A tree fifty to sixty feet high, with smooth bark, yellow wood and glabrous branches, foliage and flowers. *Leaves* eight to twelve inches long, impari-pinnate; petiole short, much thickened at the base, and there enclosing an axillary bud; rhachis slender, terete; leaflets seven to thirteen, three to four inches long, shortly petiolulate, ovate or oblong, obtuse, rather thin, terminal largest, with a longer petiolule; stipules 0. *Panicles* or racemes twelve to fourteen inches long, terminal, pendulous, laxly very many flowered; rhachis and branches slender; bracts minute, caducous; pedicels slender. *Flowers* white, with a yellow speckled spot at the base of the standard. *Calyx* obtusely five-toothed, green. *Standard* orbicular, reflexed. *Wings* obliquely oblong. *Keel-petals* free, concave. *Stamens* nearly free. *Ovary* hairy. *Pod* three to four inches long, linear, flattened. *Seeds* oblong, compressed.—*J. D. H.*

Fig. 1. calyx laid open and stamens; 2, wing-petal; 3, keel-petal; 4, ovary:—*all enlarged*; 5, legume; 6, seed: both of *nat. size.*

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TAB. 7768.

AMORPHOPHALLUS LEONENSIS.

Native of Western tropical Africa.

Nat. Ord. AROIDEÆ.—Tribe PYTHONIEÆ.

Genus AMORPHOPHALLUS, *Blume*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 970.)

AMORPHOPHALLUS (Corynophallus) *leonensis*; tubere oblato, folio hysterantho, petiolo 3–3½ pedale, lamina ampla trisecta, segmentis primariis dichotomis 1–2-pinnatifidis ultimis 6–8 poll. longis elongato-lineari-oblongis acutis acuminatisve, pedunculo crasso 2–8 poll. longo vaginis 2–4 poll. longis basi instructo, spathæ crassæ 4–6-pollicaris campanulatæ tubo 1½-poll. diam. brevi pallido in laminam inflatam apice rotundatam atro-purpuream albo-striatam et maculis paucis rotundatis ornatam ampliato, ore laminæ obliquo marginibus saturate purpureis incurvis, spadice spathæ subæquilongo breviter crasse stipitato, infl. fem. ½ in. longa, masc. latiore et paullo longiore, appendice magna crasse stipitata obovoidea apice rotundata 4 poll. longa 3 poll. diam. flavo-brunnea cancellata, staminibus dense confertis, antheris quadratis, ovariis lageniformibus in stylum attenuatis, stigmate capitato, baccis oblongis ½ poll. longis oblongo-obovoideis flavidis.

A. leonensis, *Lemaire in Hort. Van Houtte*, fasc. i. p. 1, t. 3, fig. 2, A *et* 2 B; *ex. Fl. des Serres*, Ser. I. vol. ii. (1846), t. 161.

Corynophallus leonensis, *Engl. in DC. Monogr. Phan.* vol. ii. p. 326.

C. Afzelii, *Schott in Œstr. Bot. Wochenbl.* 1857, p. 389; *Gen. Aroid.* t. 32; *Prodr. Aroid.* p. 132. *Masters in Gard. Chron.* 1872, p. 1619, fig. 343 (*sphalm. quoad spadicem*).

Hydrosme leonensis, *Engl. Jahrb.* vol. i. (1881) p. 187. *Durand et Schinz, Comp. Fl. Afr.* vol. v. p. 474.

Arum aphyllum, *Hook. in W. Gray, Travels in Western Africa*, p. 386, t. A.

Amorphophallus leonensis was discovered in Sierra Leone by Dr. Afzelius, afterwards Professor of Botany at Upsala. It was first introduced into Europe by Van Houtte in 1845. Tubers were sent from Sierra Leone to the Royal Gardens, Kew, by Mr. Walter Haydon, Curator of the Botanic station in that colony, early in 1899, which flowered in a tropical house in March of the same year, and matured their leaves in the following May. It has also been collected in Senegal and Gambia. Dr. Masters describes four varieties of it as occurring in cultivation, namely, α. *spectabilis*, in which the petiole is marked with obscure linear-oblong spots; β. *elegans* with a green petiole, bipinnatisect leaf-segments, the ultimate of which are very narrow, and γ. *latifolia*, in which the petiole is

green, the leaf-segments pinnatisect, the ultimate broader and confluent.

Descr.—*Tuber* oblate. *Leaf* solitary, appearing after the flowering; petiole stout, about three feet high; blade about a foot across, trisect; primary segments spreading, pinnatifid or bipinnatifid; ultimate narrowly linear, acute or acuminate. *Peduncle* three to eight inches high, very stout. *Spathe* erect, six inches high, pyriform; tube campanulate, an inch and three-quarters in diameter, white, gradually dilated into the concave limb, which is convolute from its lower half, three and a half inches broad about the middle, rounded at the top; mouth oblique, dark purple, streaked with dirty white, and marked with a few orbicular spots of various size; lips almost black purple, incurved. *Spadix* shortly stoutly stipitate, gradually broader upwards for about two inches, when it suddenly develops into the large, stoutly stipitate, pyriform, pitted, brown, mottled appendix, the rounded top of which reaches to the top of the spathe, and is about two and a half inches in diameter. *Fem. infl.* about half an inch long, of many, green, flagon-shaped, one-celled, one-ovuled ovaries, each narrowed into a style with a capitate stigma. *Male infl.* as long as the fem., but broader, of crowded, subquadrate anthers. *Berries* yellow, oblong-obovoid, half an inch long—*J. D. H.*

Fig. 1, section of tube of spathe with base of spadix, about twice the *nat. size*; 2, stamen; 3, ovary; 4, vertical section of do.: *all greatly enlarged.*

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Tab. 7769.

KALANCHOE farinacea.

Native of Socotra.

Nat. Ord. Crassulaceæ.

Genus Kalanchoe, *Adans.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 659.)

Kalanchoe *farinacea*; fruticulus robustus, 6–12-pollicaris, caule crasso erecto v. basi decumbente subtereti transverse ruguloso, foliis 1½–2-pollicaribus confertis decussatim oppositis sessilibus obovatis apice rotundatis basi angustatis crasse carnosis pallide virescentibus albo-pruinatis utrinque concoloribus marginibus subroseis, floribus in paniculas pedunculatas terminales subcorymbosas dispositis breviter pedicellatis, calycis minuti segmentis triangularibus, corollæ ½-poll. longæ tubo tereti infra medium flavo dein lobisque oblongis obtusis recurvis flammeis, filamentis brevibus, antheris parvis seriei superioris vix exsertis, disci squamulis linearioblongis obtusis, carpellis angustis tubum corollæ æquantibus in stylos graciles attenuatis, stigmatibus minutis.

K. farinacea, *Balf. fil. in Proc. Roy. Soc. Edinb.* vol. xi. (1882) p. 512; *et in Trans.* vol. xxi. (1888) p. 91.

K. farinacea is one of the many new and interesting plants discovered in Socotra by Dr. I. B. Balfour, during his exploration of that island in 1880, where he describes it as being common in crevices of limestone rocks. It is one of four species found there by him, of which three were new to science. More recently, in 1897, seeds of it, from which the specimen here figured was raised, were sent to the Royal Gardens, Kew, by the late Mr. Theodore Bent. It flowered in a greenhouse in August, 1900, and continued flowering for two months.

Descr.—A stout, erect, sparingly branched, succulent shrub, with mealy white branches, leaves, and panicle. *Leaves* crowded towards the ends of the branches, sessile, spreading, one and a half to two inches long, obovate, narrowed at the base, concave, quite entire, tip rounded, very thick, pale green beneath the thin covering of mealy pubescence, margins faintly rosy. *Panicle* terminal, subcorymbiform; rhachis and branches stout; bracts small, oblong, fleshy. *Flowers* shortly pedicelled, erect, one-half to three-quarters of an inch long. *Calyx* minute, obtusely four-lobed. *Corolla* narrowly campanulate; tube about

half an inch long, terete, yellow below the middle, bright scarlet above it, as are the ovate, sub-acute, spreading lobes. *Stamens* small, the upper series hardly exserted; filaments very short; anthers broadly oblong. *Scales* of the disk small, linear-oblong. *Carpels* narrowed into slender styles with minute stigmas.—*J. D. H.*

Fig. 1, portion of leaf with mealy pubescence; 2, calyx; 3, corolla laid open; 4, scales of the disk and carpels:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Lith.

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Tab. 7770.

ROSA Fedtschenkoana.

Native of Turkestan.

Nat. Ord. Rosaceæ.—Tribe Roseæ.

Genus Rosa, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 625.)

Rosa (Cinnamomeæ) *Fedtschenkoana*; frutex erectus, vage ramosus, ramis ramulisque crebre armatis, aculeis stipularibus rigidis rectis v. recurvis basin versus paullo dilatatis et compressis ceteris setiformibus rectis, foliis glaucescentibus 5–7-foliolatis, rhachi gracili sparse setaceo, foliolis pollicaribus ellipticis acutis simpliciter serrulatis terminali paullo majore, stipulis acuminatis petiolo adnatis apicibus liberis floribus solitariis v. 2–4-nis albis malodoris, pedunculis ovariis ellipsoideis sepalisque glanduloso-pilosis, sepalis lanceolatis apicibus linearibus apice simplicibus v. paullo dilatatis, petalis sepalis bis terve longioribus, carpellis stylisque pilis longis sparse hirsutis, fructibus ellipsoideis v. subpyrformibus setulosis rubris sepalis persistentibus coronatis.

R. Fedtschenkoana, *Regel. Del. Sem. Hort. Petrop.* 1876, p. 36; *et in Acta Horti Petrop.* vol. v. (1877) p. 314.

A very handsome white rose, with almost black bark on the older branches, red brown on the younger. It was discovered in the Turkestan and Kokan regions of Central Asia, by the Russian travellers, Fedtschenko & Korolkow, by whom it was introduced into the Imperial Botanic Gardens of St. Petersburgh. A plant of it was procured for the Royal Gardens, Kew, from Mr. T. Smith's Nursery at Newry, in 1890, which has developed into a rambling, very glaucous shrub of free growth, and flowered in June, 1900, fruiting in the following September.

According to Dr. Regel it is a variable plant, of which he describes four forms, differing from one another chiefly in the amount of glandular hairs in the calyx, and in the form of the fruit, from globose to lageniform. The scent of the flowers is unpleasant.

Descr.—A free-growing, very glaucous, much-branched, closely prickly shrub; stipular prickles straight, or slightly recurved, compressed, and somewhat dilated at the base, other prickles on the branches reduced to bristles, glandular hairs none. *Leaves* four to five inches long; rhachis slender, sparsely setose; leaflets five to seven, an inch long, elliptic, acute, simply serrulate, glaucous; stipules adnate

to the petiole, their acuminate tips only free. *Flowers* solitary, or two to four on a peduncle, large white; peduncles and ellipsoid ovaries more or less glandular-hairy. *Sepals* lanceolate, tips linear or slightly dilated. *Petals* twice or thrice as long as the sepals. *Carpels* and *styles* sparsely hirsute. *Fruit* ellipsoid or sub-pyriform, crowned with the persistent sepals, red.—*J. D. H.*

Fig. 1, bud; 1 and 3, anthers; 4, carpels :—*all enlarged*—5, fruit of the *natural size.*

M.S.del. J.N.Fitch lith.

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Tab. 7771.

STAPELIA nobilis.

Native of South Africa.

Nat. Ord. Asclepiadeæ.—Tribe Stapelieæ.

Genus Stapelia, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 784.)

Stapelia (Tridentea) *nobilis*; caule decumbente basi ramoso tetragono pubescente angulis dentatis faciebus concavis, foliorum rudimentis dentibus insertis $\frac{1}{12}$ poll. longis erectis ovatis acutis puberulis, floribus solitariis binisve basin versus ramulorum insertis, pedunculo crasso pollicari velutino, sepalis $\frac{1}{4}$ poll. longis ovato-lanceolatis acutis velutinis, corolla ampla extus rubro-purpurea puberula intus ochracea pilis longis laxe villosa et lineis sanguineis trabeculata, tubo campanulato $1\frac{1}{2}$ poll. diam., lobis $2\frac{3}{4}$ poll. longis ovato-lanceolatis acuminatis reflexis pilis purpureis ciliatis, coronæ exterioris brunneo-purpureæ lobis $\frac{1}{4}$ poll. longis ascendentibus linearibus 3-dentatis glabris, interioris lobis inæqualiter bipartitis segmentis subulatis triquetris suberectis.

S. nobilis, *N.E. Br. mss.*

Mr. N. E. Brown, from whose description of this plant, prepared for the forthcoming part of the *Kew Bulletin*, the above is taken, says that it is closely allied to *S. gigantea* (tab. 7068); differing in the stems not being so stout, and their angles much less compressed. The flowers are similar in colour, but those of *S. nobilis* are much smaller, have a distinctly campanulate tube, and are more hairy within.

The plant here figured was sent to the Royal Gardens, Kew, in 1897, by Mr. T. G. Griffiths of Port Elizabeth, Cape Colony, but of its exact native habitat I have no information. It flowered in the Succulent House in May, 1900.

Descr.—*Stem* decumbent, branched at the base, about two-thirds of an inch in diameter, pubescent, four-angled; angles toothed, their faces concave. *Leaves* rudimentary, erect, inserted on the teeth of the angles, about one-twelfth of an inch long, ovate, acute, puberulous. *Flowers* solitary, or two on the lower part of the branches; peduncle an inch long, stout, velvety. *Sepals* about one-fourth of an inch long, ovate, acute, velvety. *Corolla* large, red-purple externally, internally villous with long hairs, ochraceous,

trabeculate with blood-red cross-lines; tube campanulate, half an inch in diameter; lobes two and three-quarters of an inch long, ovate-lanceolate, acuminate, reflexed, ciliate with purple hairs. *Outer corona* purple-brown, glabrous; lobes a quarter of an inch long, linear, ascending, three-toothed. *Inner corona* with unequally bipartite lobes.—*J. D. H.*

Fig. 1, corona; 2, lobe of outer corona; 3, inner corona; 4, pollinia:—*all enlarged.*

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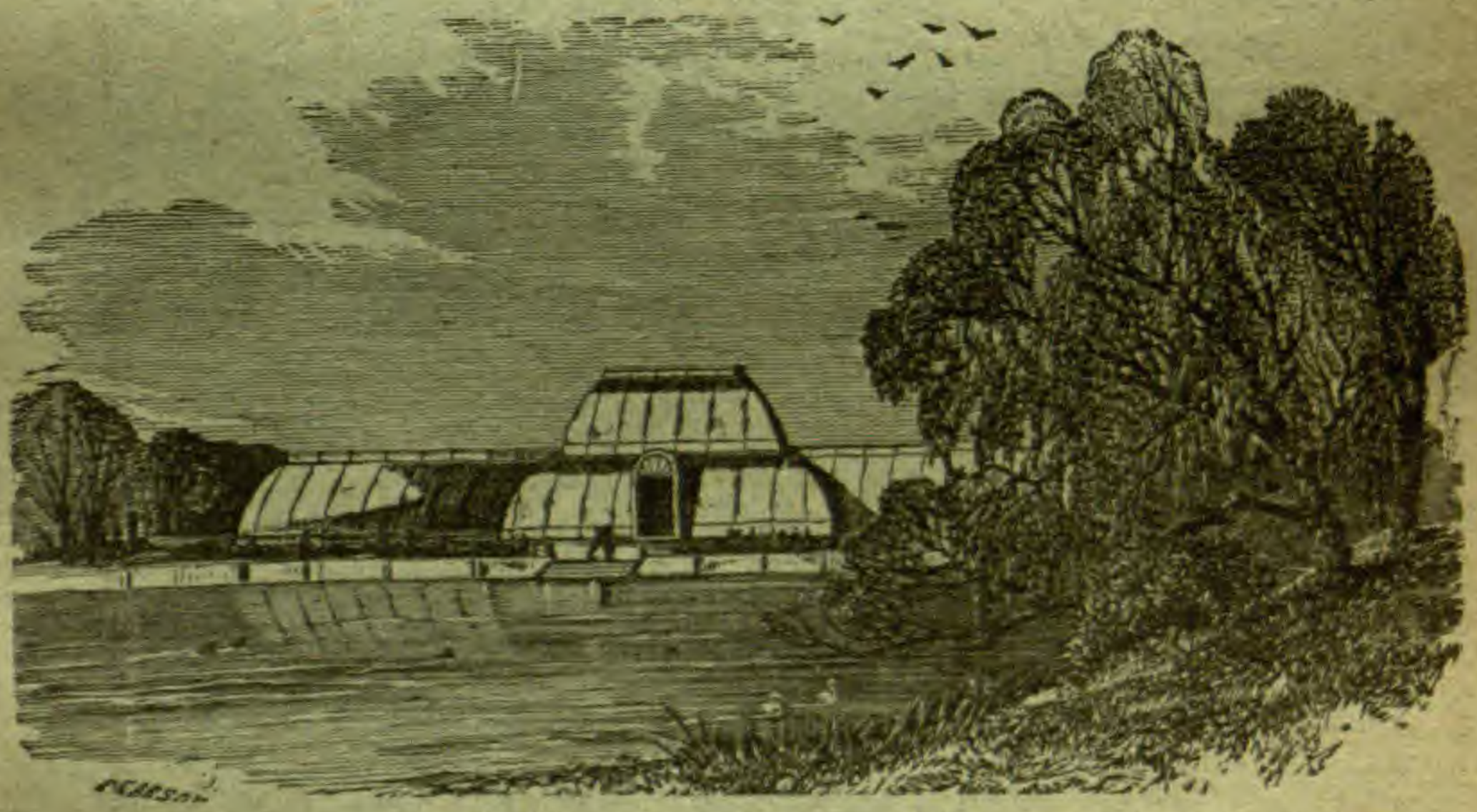

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Tab. 7772.

WYETHIA mollis.

Native of California.

Nat. Ord. Compositæ.—Tribe Helianthoideæ.

Genus Wyethia, *Nutt.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 374).

Wyethia (Alarçonia) *mollis*; herba 2–3-pedalis, erecta, robusta, floccoso-tomentosa, demum glabrescens, radice crasso, caule simplici v. parce ramoso, foliis inferioribus pedalibus ovatis oblongis v. lineari-oblongis acutis v. apice rotundatis basi rotundatis cuneatis vel in petiolum crassum angustatis coriaceis nervis numerosis patulis nervulis reticulatis superioribus ovato-lanceolatis, petiolo 2–4 poll. longo, capitulis paucis amplis inferioribus longe superioribus breviter pedicellatis, pedicellis crassis, involucri cupularis pollicaris bracteis 10–12 oblongo-lanceolatis subacutis herbaceis, receptaculi bracteolis lineari-oblongis, floribus aurantiacis radii 10–15 ligula 1½ poll. longa ¼ poll. lata patenti-recurva apice bidenticulata, achæniis lineari-oblongis compressis marginibus ciliolatis, pappi setis brevibus subulatis rigidis scabridis lateralibus sæpius longioribus.

W. mollis, *A. Gray in Proc. Amer. Acad.* vol. vi. (1865) p. 544; *Synopt. Fl. N. Am. Gamopet.* p. 208; *et in Bot. Calif.* vol. i. p. 349.

Wyethia, a genus confined to Western North America, consists of about a dozen species. It is nearly allied to *Helianthus*, differing in having fertile ray-flowers and in the pappus. A. Gray describes the species as having a balsamic odour, adding that the thick roots and the seeds were used as food by the Indians. The name is a tribute by Mr. Nuttall to the memory of Nathaniel J. Wyeth, who collected the species upon which the genus was founded, and who subsequently accompanied its founder in one of the first journeys made across the whole continent of North America.

The sectional name of *Alarçonia* is adopted from De Candolle (Prodr., vol. v. p. 537), who gave it as a generic one to a species, *W. helenioides*, previously described by Nuttall. It is dedicated to the memory of Fernando de Alarçon, a noble Spanish navigator, who, in 1540, first visited and carefully surveyed the coast of California.

W. mollis is a native of the Sierra Nevada, especially on the eastern side, from Sierra Valley to Virginia city in Nevada, thence westward to the Yosemite and other valleys of the Sierra in California.

May 1st, 1901.

For the specimen here figured I am indebted to my friend the Rev. Canon Ellacombe, of Bitton, in whose rich collection of hardy plants it flowered in June, 1900.

Descr.—A stout, perennial herb, one to three feet high, covered with a white, floccose tomentum. *Leaves* few, coriaceous, radical a foot long, ovate- or linear-oblong, acute, obtuse or rounded and apiculate at the tip, base acute, rounded or narrowed into the stout petiole, upper leaves ovate or lanceolate, acute. *Heads* few, shortly stoutly pedicelled, four to five inches in diameter. *Involucre* cupular; bracts ten to twelve, narrow, acute, erect. *Ray-flowers* ten to fifteen; ligule an inch and a half long by a quarter of an inch broad, spreading and recurved, golden-yellow, as are the disk-flowers. *Scales* of the *receptacle* linear. *Achenes* linear-oblong, compressed, margins ciliolate. *Pappus* of a few unequal, rigid, scabrid, persistent bristles.—*J. D. H.*

Fig. 1. bract of involucre; 2, ray-flower; 3, disk-flower; 4, stamens; *5, style*-arms of disk-flowers;—*all enlarged.*

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Tab. 7773.

PYRUS alnifolia.

Native of Japan and China.

Nat. Ord. Rosaceæ.—Tribe Pomeæ.

Genus Pyrus, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 626.)

Pyrus (Sorbus) *alnifolia*; arbor parva, ramis lenticellatis cortice fusco vestitis, foliis breviter petiolatis ovato-rotundatis acutis vel acuminatis argute duplo-triplicato-serratis basi rotundatis cordatisve submembranaceis glabris penninerviis, nervis numerosis parallelis supra impressis subtus gracilibus prominulis, nervulis tenuissimis, corymbis breviter pedunculatis multifloris, pedunculi ramis pedicellisque brevibus puberulis, floribus ad ½ poll. diam. albis, calycis tomentosi lobis obtusis, petalorum ungue barbato, fructibus ellipsoideis v. subglobosis ½ poll. longis basi et apice rotundatis rubris.

P. alnifolia, *Franch. & Sav. Enum. Pl. Jap.* vol. ii. p. 350.

Sorbus alnifolia, *C. Koch in Ann. Mus. Lugd. Bat.* vol. i. (1864) p. 249. *Maxim. Mel. Biol. Dec.* ix. (1872) p 173.

Cratægus alnifolia, *Sieb. & Zucc. in Abhandl. Akad. Muench.* vol. iv. pars II. (1843) p. 130. *Miquel, Ann. Mus. Bot. Lugd. Bat.* vol. iii. p. 40. *Franch. & Sav. l.c.* vol. i. p. 141.

Aria tiliæfolia, *Decne. in Nouv. Arch. Mus. Par.* Sér. I. vol. x. (1874) p. 166.

A. alnifolia, *Decne. l.c.*

Pyrus alnifolia is a small tree, first described from Japan, where it was discovered by Siebold. It inhabits the upper limit of the forest region in many parts of the Archipelago, including that of the celebrated mountain Fudji-yama. Maximovicz found it in Eastern Manchuria, and Dr. Henry at elevations of seven thousand feet to nine thousand five hundred feet in the Hupeh province of China proper.

The specimen here figured is from a plant which flowered in the Arboretum of the Royal Gardens, Kew, in May, 1900. It was purchased from Mr. L. Späth, Nurseryman of Berlin, in 1896.

Descr.—A small tree, glabrous except the corymbs. *Leaves* two to three inches long, shortly petioled, broadly ovate or almost orbicular, acute or acuminate, sharply, doubly or trebly serrate, base rounded or cordate, bright green above, with many parallel immersed nerves, which are prominent, but very slender on the pale under surface,

very thin in texture; petiole one half to three-fourths of an inch long, slender. *Corymbs* two to three inches in diameter, shortly peduncled; peduncle, branches and pedicels puberulous. *Flowers* white, about half an inch in diameter. *Calyx* tomentose; lobes short, obtuse. *Petals* with a bearded claw. *Styles* three. *Fruit* about half an inch long, ellipsoid or subglobose, bright red.—*J. D. H.*

Fig. 1, unexpanded flower; 2, vertical section of calyx with stamens and 2 styles:—both *enlarged*; 3, fruit, of the *natural size*.

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Tab. 7774.

LONICERA pyrenaica.

Native of the Pyrenees.

Nat. Ord. Caprifoliaceæ.—Tribe Lonicereæ.

Genus Lonicera, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 5.)

Lonicera (Xylosteum) *pyrenaica*; frutex dumosus, erectus, glaberrimus, ramulis patentibus, foliis apices versus ramulorum fasciculatis sessilibus obovato-cuneatis oblanceolatisve acutis glaucis caducis, pedunculis foliis dimidio brevioribus, bracteis 2 foliaceis, bracteolis 4 minutis ovatis, ovariis subglobosis basi tantum connatis, calycis dentibus minutis, corollæ pallide roseæ tubo ½ poll. longo basi gibboso lobis ovato-rotundatis, genitalibus breviter exsertis, stylo villoso, baccis pisiformibus fere liberis rubris.

L. pyrenaica, *Linn. Sp. Pl.* p. 174. *Duham. Arb.* vol. ii. t. 110; Ed. II. vol. i. t. 15. *DC. Fl. Fr.* vol. iv. p. 272; *Prodr.* vol. iv. p. 335. *Ait. Hort. Kew*, Ed. II. vol. i. p. 379. *Benth. Cat. Pl. Pyren.* p. 97. *Allioni, Fl. Pedem.* vol. i. p. 128. *Poll. Fl. Veron.* vol. i. p. 285. *Reichb. Ic. Fl. Germ.* vol. xvii. t. 1175, fig. 2. *Parlat. Fl. Ital.* vol. vii. p. 127. *Willk. & Lange, Prodr. Fl. Hisp.* vol. ii. p. 353. *Gren. & Godr. Fl. de France*, vol. ii. p. 11.

Caprifolium pyrenaicum, *Lam. Fl. Fr.* vol. iii. p. 366.

Lonicera pedunculis bifloris, &c., *Royen, Fl. Leyd. Prodr.* p. 238.

Xylosteon pyrenaicum, *Tournef. Instit.* p. 609. *Magnol Hort. Reg. Monsp.* p. 209, *cum Ic. Rand, Hort. Med. Chels.* ed. 1739, p. 211.

Periclymenum vel Xylostaeum Pyrenaicum, *Ray, Hist. Pl.* vol. iii.; *Dendrol.* p. 29.

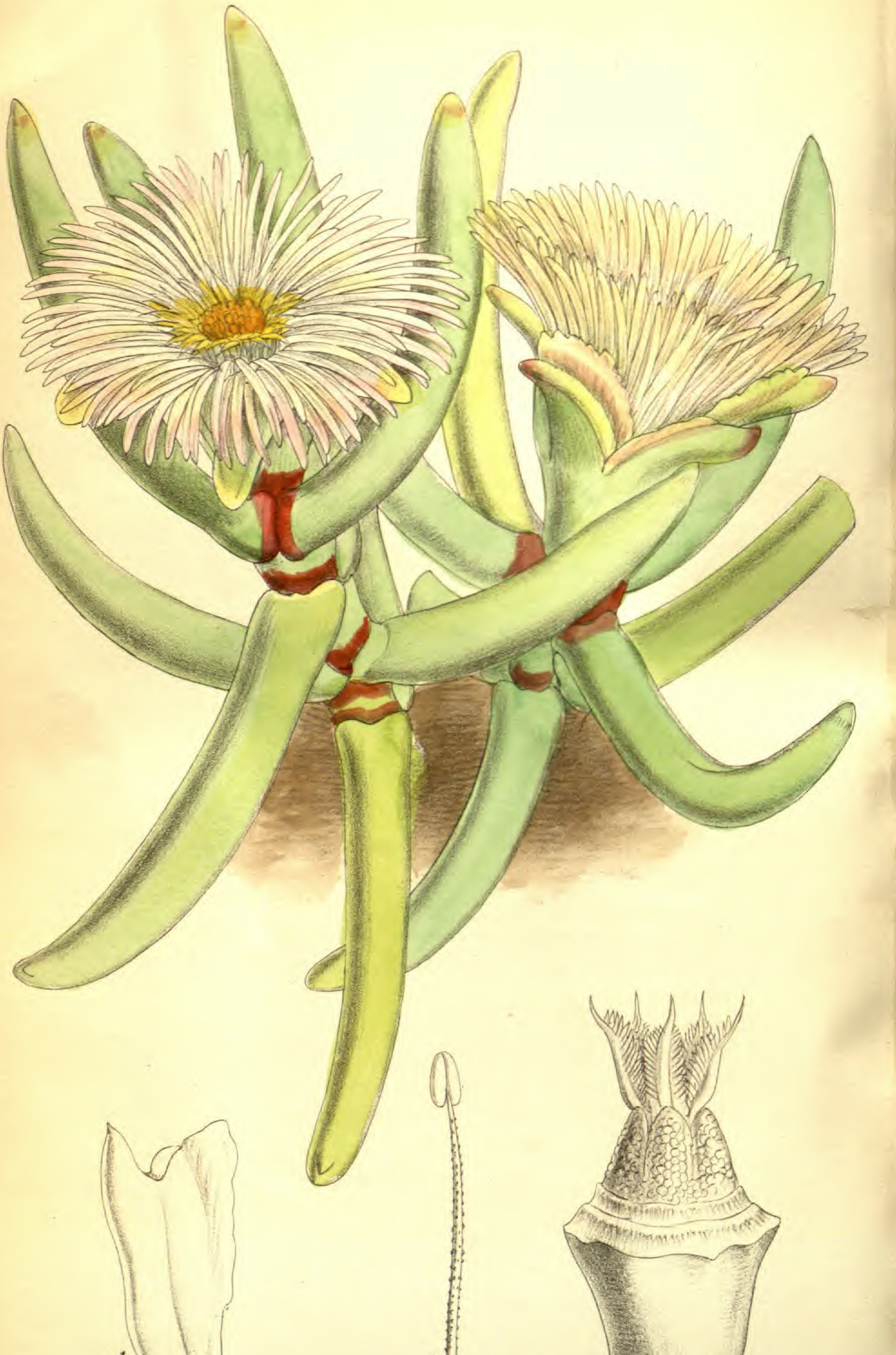
Lonicera pyrenaica is a very old garden plant, having, according to Philip Miller, been in cultivation in England since 1793. It is a native of the Eastern Pyrenees, and of the larger Balearic Islands, at elevations in the latter of twelve hundred feet to fourteen hundred feet.

In the Royal Gardens, Kew, it forms a small shrub in the Rock garden, flowering profusely in May and June.

Descr.—A small, much-branched, glabrous shrub, with close-set, short branchlets. *Leaves* crowded towards the ends of the branchlets, sessile, spreading, about an inch long, oblanceolate or cuneiformly obovate, acute, glaucous, deciduous. *Peduncles* about half as long as the leaves, each bearing two bracteate sessile flowers, shortly united by the bases of their ovaries. *Bracts* leaf-like, spreading; bracteoles two to each flower, minute. *Ovary* sub-globose. *Calyx-teeth* minute, triangular. *Corolla* pale rose-coloured

or nearly colourless; tube half an inch long, gibbous at the base; lobes shorter than the tube, orbicular-ovate. *Stamens* very shortly exserted. *Style* slender, tomentose. *Berries* pisiform, nearly free, brick-red.—*J. D. H.*

Fig. 1, peduncle bracts bracteoles and two flowers, one unexpanded, the other with the corolla removed; 2 and 3, anthers:—*all enlarged*; 4, berries of the *natural size*.



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Tab. 7775.

MESEMBRYANTHEMUM CALAMIFORME.

Native of South Africa.

Nat. Ord. Ficoideæ.—Tribe Mesembryeæ.

Genus Mesembryanthemum, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 853.)

Mesembryanthemum (Calamiformia) *calamiforme*; glaberrimum, caule brevi robusto lignoso, foliis 6–8 oppositis basi lata insertis 2-3 poll. longis cylindraceis obtusis mucronulatisve carnosis ad ⅓ poll. diam. subglaucis tenuissime punctatis, floribus pseudo-terminalibus solitariis 2–2½ poll. latis breviter crasse pedunculatis, calycis tubo brevi crasso lobis 5 inæqualibus 3 majoribus crasse carnosis marginibus dilatatis quasi bialatis alis truncatis apice producto obtuso v. acuto, 2 minoribus submembranaceis, petalis numerosissimis sepalis 2–3-plo longioribus sub 3-seriatis linearibus angustissimis albis apicibus pallide roseis, filamentis inæquilongis petalis multo brevioribus 6–8-seriatis pallidis, antheris parvis aurantiacis, ovario conico, stigmatibus 5–8 erectis cuspidatis intus barbatis, capsula polysperma.

M. calamiforme, *Linn. Sp. Pl.* p. 481. *Haw. Obs. Gen. Mesemb.* p. 140; *Misc. Nat.* p. 26; *Syn. Pl. Succ.* p. 208: *Revis. Plant. Succ.* 105. *DC. Pl. Grasses*, t. 5; *Prodr.* vol. iii. p. 424. *Ait. Hort. Kew.* ed. 2 vol. iii. p. 215. *Salm. Dyck, Monogr. Mesembr.* § 10, fig. 1. *Harv. & Sond. Fl. Cap.* vol. ii. p. 405.

M. calamiforme, &c., *Dillen. Hort. Elth.* p. 228, t. 186, fig. 228.

Ficoidea capensis, humilis, &c., *Bradley, Hist. Pl. Succ.* Dec. ii. p. 10, fig. 19.

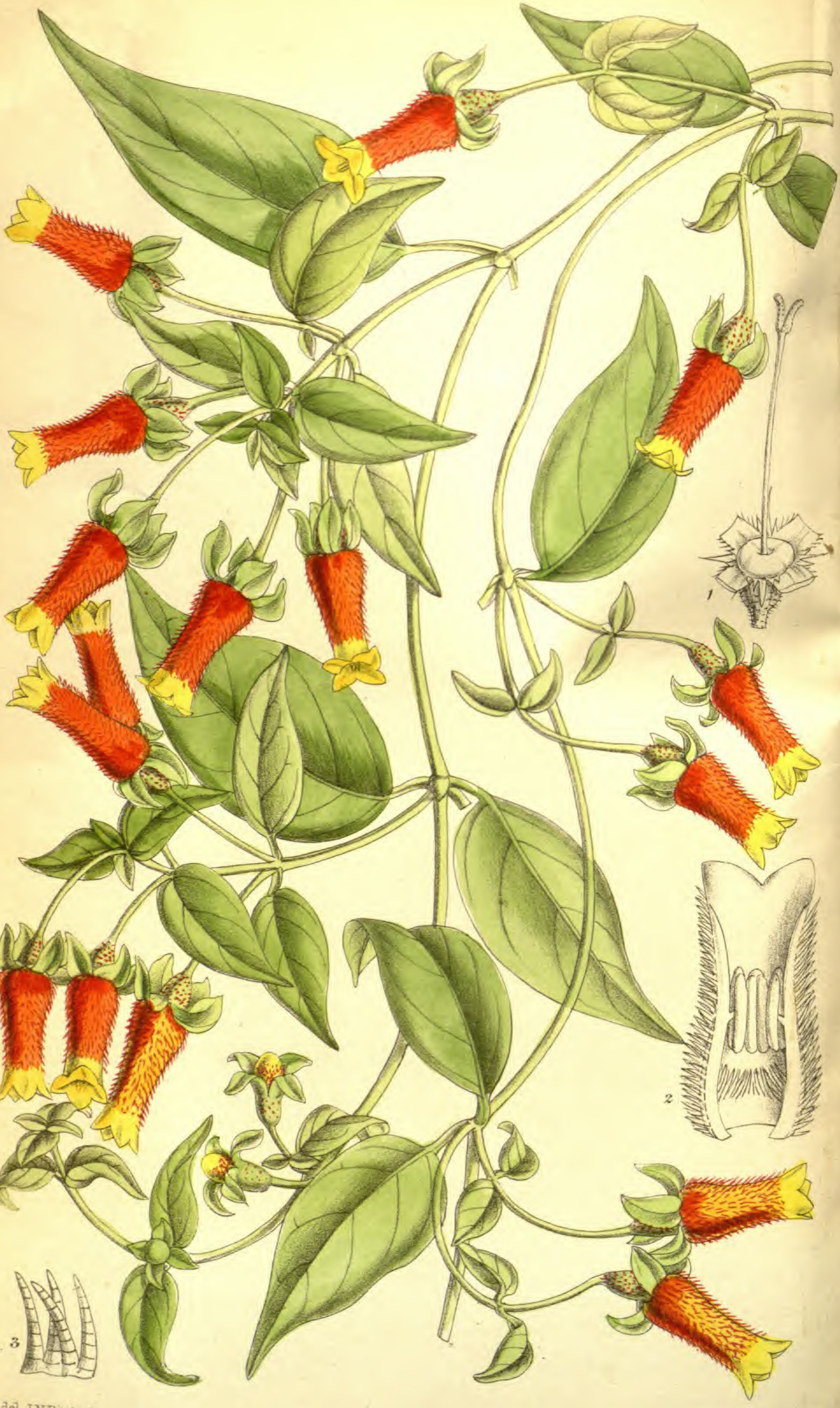
The genus *Mesembryanthemum* holds an important place in the history of Horticulture. Dillenius, who treats of the species known to him at great length, gives an interesting account of the successive introduction of those known to his predecessors. Of these he says 15 were known to Bobart (1648); 20 to Breyn (1680); 39 to Ray (1686); 23 to Herman (1687); 21 to Plukenet (1696); 30 to Bradley (1716); 36 to Tournefort. Dillenius himself describes and figures 47 species, all cultivated in Sherard's garden at Eltham in 1732. Following Dillenius, Linneus in the "Hortus Cliffortianus" (1737) gives 30 species; and in the "*Species plantarum*" (1753) 35, where he reduces some of Dillenius's species to varieties. Coming down to later times, Aiton's "Hortus Kewensis" (ed. I. 1789) contains 70 species, and Ed. II. (1811) 175. Haworth's "Revis. Plant. Succ." (1821) describes 310. Harvey &

Sonder's "Flora Capensis" 293, exclusive of imperfectly known species. In the "Index Kewensis" (1895) 375 species are enumerated, of which 113 were, in 1899, in cultivation in the Royal Gardens, Kew. Lastly, 25 are figured in this Magazine.

The specimen of *M. calamiforme* here figured was received in 1898, with other interesting plants, from Mr. Chalwin, Superintendent of the Cape Town Botanical Gardens, with the information that it is a native of the Karroo district. It flowered in a greenhouse of the Royal Gardens in June, 1900.

Descr.—Glabrous. *Stem* short, stout, woody. *Leaves* six to eight, opposite, sessile by a much-thickened base, two to three inches long, cylindric, obtuse, about one-third of an inch in diameter, sub-glaucous. *Flowers* solitary, terminal, very stoutly peduncled, two to two and a half inches in diameter. *Calyx-tube* short; lobes five, unequal, two larger, fleshy, broadly winged, wings truncate; tip elongate, acute or obtuse; two smaller thinner. *Petals* innumerable, sub-triseriate, very narrow, white with pink tips. *Stamens* much shorter than the petals; anthers small, yellow. *Ovary* obconic, stigmas five to eight, erect, cuspidate. *Capsule* many-seeded.—*J. D. H.*

Fig. 1, one of the large sepals; 2, stamen; 3, ovary, style and stigmas:—*all enlarged.*



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Tab. 7776.

MANETTIA BICOLOR.

Native of Brasil.

Nat. Ord. Rubiaceæ.—Tribe Cinchoneæ.

Genus Manettia, *Mutis*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 37.)

Manettia (Heterochroa) *bicolor*; frutex scandens, gracilis, ramosus, ramulis teretibus puberulis, foliis 2–6 poll. longis breviter petiolatis ovatis ovato-lanceolatisve acuminatis supra subscaberulis subtus pallidis nervis tomentellis, stipulis parvis late ovatis, floribus axillaribus et terminalibus, pedicellis corollæ subæquilongis puberulis, calycis tubo parvo turbinato cinereo-tomentoso, lobis $\frac{1}{3}$ poll. longis ovatis oblongisve acutis reflexis viridibus extus puberulis, corolla sepalis bis longiore cylindracea tereti a medio ad basin sensim ampliata setulis rigidis hispida coccinea apicem versus nuda aurea intus basin versus annulo pilorum instructa, ore paullo dilatato 4-fido lobis parvis triangularibus patulis, antheris lineari-oblongis infra medium tubi insertis, disco pulvinari, stylo gracili stigmatibus 2 linearibus, capsula globoso-pyriformi tomentosa.

M. bicolor, *Paxt. Mag. Bot.* vol. x. (1843) p. 27. *Flore des Serres*, vol. ii. p. 445, t. 6. *Dietr. Fl. Univers.* t. 14. *Rev. Hort. Belg.* vol. xxi. (1895) p. 49.

M. luteo-rubra, *Benth. in Linnaea*, vol. xxiii. (1850) p. 445. *Schumann in Mart. Fl. Bras.* vol. vi. pars vi. p. 174.

M. filicaulis, *Wawra in Œstr. Bot. Zeitschr.* vol. xxxi. (1881) p. 281; in *Bot. Reis. Pr. Sax Coburg*, p. 118, t. 17.

M. pubescens, partim, *Cham. & Schlecht. in Linnaea*, vol. iv. (1829) p. 170.

M. scabra, *Herb. Pohl.*

Guaguebina luteo-rubra, *Vell. Fl. Flum.* vol. i. t. 121; *textu Ed. Netto*, p. 46.

The beautiful and now well-known stove-climber here figured was imported into Europe from the Organ Mts. in Brasil by Mr. James Veitch, grandfather of the partners in the celebrated firm of that name, and founder, I believe, of the business, which was then carried on at Mount Radford, near Exeter. This was about sixty years ago, when William Lobb, then collecting for his firm in Brasil, sent home seeds. It appears to have a very wide range of distribution, for there are specimens in the Kew Herbarium from Uruguay, Paraguay, St. Catherine, Rio de Janeiro, and Minas Geraes all in Brasil. In the Royal Gardens, I am informed that it is never out of flower.

The genus *Manettia* is a very large one, consisting of upwards of thirty species, spread over tropical America.

May 1st, 1901.

Only one has previously been figured in this work, *M. cordifolia*, Mart. t. 3202, for *M. micans*, Pœpp. & Endl. t. 5495, is only a robust form of that species.

Descr.—A slender, much-branched, more or less puberulous climber. *Leaves* two to six inches long, shortly petioled, ovate or ovate-lanceolate, acuminate, sub-scaberulous and bright green above, paler beneath, with subtomentose nerves; stipules very small, broadly ovate. *Flowers* axillary and terminal, tetramerous; pedicels about as long as the corolla. *Calyx-tube* small, turbinate, tomentose; lobes ovate or oblong, acute, reflexed, green. *Corolla-tube* three-quarters of an inch long, cylindric, terete, dilated towards the base, hispid with scarlet hairs, except towards the apex, which is naked and golden-yellow; lobes very short, broadly triangular. *Anthers* sessile in the middle of the tube of the corolla, above a ring of hairs. *Style* slender, stigmas two, linear.—*J. D. H.*

Fig. 1, calyx-tube, disk, style and stigmas; 2, section of corolla with anthers; 3, hairs of the surface of the corolla:—*all enlarged.*

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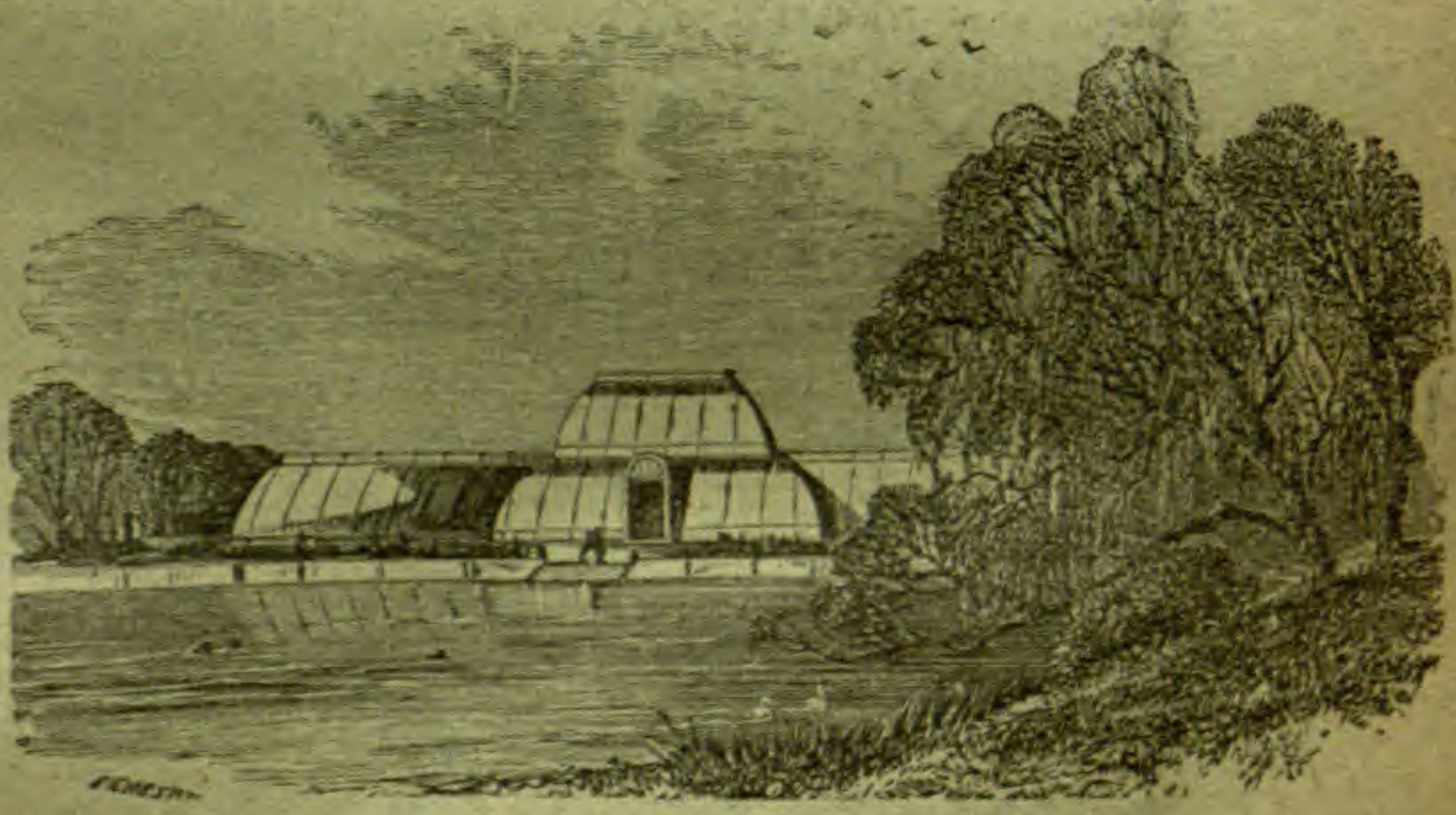

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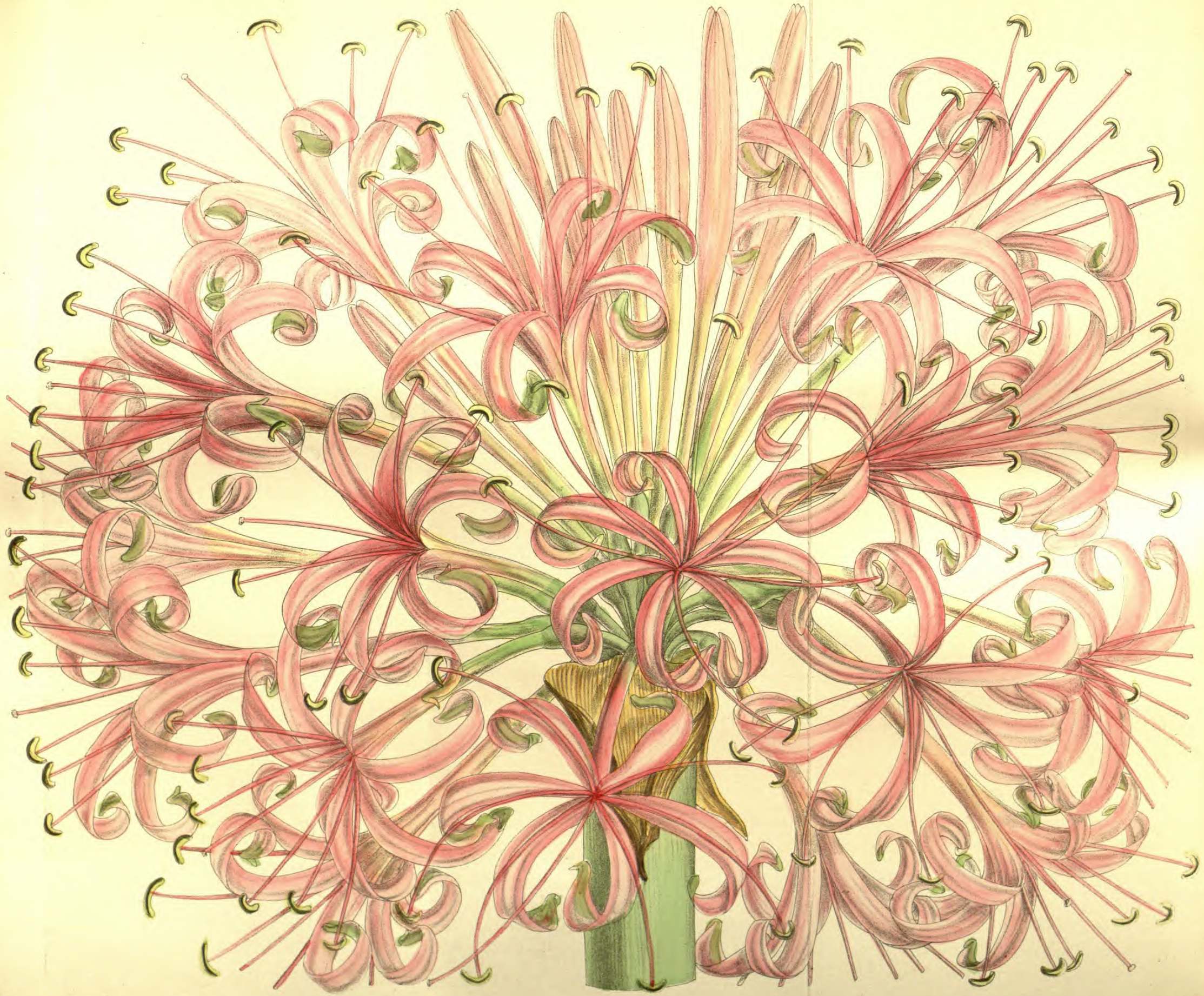

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Tab. 7777–8.

CRINUM RHODANTHUM.

Native of Ngami Land.

Nat. Ord. Amaryllideæ.—Tribe Amaryllæ.

Genus Crinum, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 726.)

Crinum (Stenaster) *rhodanthum*; bulbo ovoideo 4 poll. diam., foliis 12–15 bipedalibus ad 2 poll. latis distichis loratis carnosulis fragilibus glaucescentibus enerviis apice rotundatis marginibus angustissime scariosis erosis, pedunculo brevi lato valde compresso, spathis 1–2-pollicaribus deltoideis acuminatis, umbella hemisphærica fere 2-ped. diam. multiflora, pedicellis 1½–2 poll. longis, perianthii tubo 3-pollicari fere recto angusto cylindraceo, limbi saturate rosei segmentis patenti-revolutis loratis 2¼ poll. longis, filamentis erectis perianthii segmentis æquilongis, antheris ⅙ poll. longis fuscis, stylo gracili recto filamentis æquilongo, stigmate capitellato.

C. rhodanthum, *Baker in Dyer, Flora of Tropical Africa*, vol. vii. p. 397.

The term Ngami Land indicates the country around a lake of that name, situated in the heart of Africa, in about lat. S. 20°, and approximately half way between the Atlantic and Indian Oceans. Though long known by reports from the Bechuana tribes of S. Africa, it was not visited by Europeans till 1849, when the intrepid travellers, Oswell and Livingstone, reached it after a perilous crossing of the desert intervening between it and Bechuanaland.

Though situated within the tropics, the vegetation of Ngami Land is South African, as exemplified by a most beautifully preserved herbarium made there by Lieut. (now Capt.) and Mrs. Lugard, and presented to Kew, of which an account will be communicated to the Linnean Society by Mr. N. E. Brown. This herbarium is rich in novelties, and is rendered exceptionally valuable from being accompanied by a series of coloured drawings, with analyses of many species, by Mrs. Lugard, which are of rare excellence in point of execution and scientific accuracy, and of which that lady has kindly allowed copies to be taken for the Kew collection of botanical drawings.

The exact locality of the *Crinum* is Mt. Kwebe, situated a little to the eastward of the lake, which is described

as being conspicuous for the number of Baobab trees growing upon it. The bulb was presented by Mrs. Lugard to the Royal Gardens, Kew, in 1899, where it flowered in a tropical house.

Descr.—*Bulb* four inches in diameter, ovoid. *Leaves* twelve to fifteen, distichous, lorate, two feet long by two inches broad, glaucous; rather fleshy, brittle, tip rounded; margins narrowly scarious, erose. *Peduncle* short, flattened, an inch broad. *Spathes* two, deltoid, acuminate, two to three inches long. *Umbels* hemispheric, laxly very many-flowered, nearly two feet in diameter; pedicels half to one inch long. *Perianth-tube* three inches long, very slender, cylindric, nearly straight, pale red; segments of limb spreading and revolute, two and a half inches long by one-sixth of an inch broad, lorate, obtuse, bright red. *Filaments* about as long as the segments of the limb, red, very slender; anthers one-sixth of an inch long, brown. *Style* as long as the filaments, very slender, red; stigma capitellate.—*J. D. H.*

Tab. 7777, umbel with top of peduncle and spathe of *nat. size*.
Tab. 7778, *reduced* view of whole plant; fig. 1, portion of margin of leaf; 2 and 3, anthers; 4, top of style and stigma:—*all enlarged*.

Tab. 7779.

BESCHCORNERIA Wrightii.

Native of Mexico?

Nat. Ord. Amaryllideæ.—Tribe Agaveæ.

Genus Beschorneria, *Kunth*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 738.)

Beschorneria *Wrightii*; trunco robusto, foliis ad 50 dense confertis patenti-recurvis ensiformibus 4–5 ped. longis crasse coriaceis medium versus 2-poll. latis basi dilatatis crassissimis margine denticulatis apice in acumen brunneum elongatum angustatis utrinque læte viridibus dorso costa lata percursis, pedunculo brevi robusto foliis paucis abbreviatis erectis instructo, paniculæ 8-pedalis pyramidalis rhachi ramulisque patenti-recurvis glaberrimis roseis, floribus secus ramulos in fasciculos 2–4-flores dispositis nutantibus breviter pedicellatis pubescentibus, bracteis $\frac{1}{2}$–1 poll. longis ovato-lanceolatis bracteolisque minoribus scariosis albis roseo striatis, pedicellis glaberrimis, ovario $\frac{3}{4}$ poll. longo cylindraceo, perianthii tubo ovario paullo longiore et latiore, segmentis lineari-spathulatis viridibus marginibus flavidis apicibus patulis intus flavis, antheris linearibus apicibus exsertis.

Beschorneria Wrightii is much the largest species of the five that have as yet flowered at Kew, and been figured in this work (tabs. 4642, 5203, 6641, 6091, 6768). Of these it is most nearly allied to *B. Dekosteriana*, C. Koch, Wochenschr. vii. (1864), 187 (*B. Decosteriana*, Baker, tab. 6768), which differs in the quite glabrous flowers. Of its native country, or the date of its introduction into the Royal Gardens of Kew, where it bore the erroneous name of *Furcræa Bedinghausii?* a very different plant, there is no record. With the exception of a Texan species (*B. dubia*), Mexico is the native country of the genus. I have given it the name of Mr. Charles H. Wright, A.L.S., Assistant in the Kew Herbarium, who had examined and distinguished it from its congeners. It flowered in the Mexican division of the Temperate House of the Royal Gardens in June, 1900.

Descr.—*Stem* (of the specimen figured) eighteen inches high, six inches in diameter. *Leaves* about fifty, densely crowded, spreading and recurved, ensiform, coriaceous, four to five feet long by two inches broad about the middle; tip narrowed into a brown, dagger-like tip; base dilated,

very thick, bi-convex; margins very narrowly scarious, denticulate. *Peduncle* short, stout, bearing a few short, erect leaves. *Panicle* pyramidal, eight feet high; rhachis stout; branches and branchlets spreading or recurved, quite glabrous; bracts and bracteoles scarious, white, streaked with red. *Flowers* fascicled on the branchlets, shortly pedicelled, nodding, green, pubescent. *Ovary* three-fourths of an inch long, cylindric. *Perianth-tube* rather longer and broader than the ovary; segments erect, linear-spathulate, green, with broad, yellow margins, yellow within; tips obtuse, spreading. *Anthers* linear, tips only exserted. *Stigma* capitellate, three-lobed.—*J. D. H.*

Fig. 1, portion of margin of leaf; 2 and 3, anthers; 4, top of style and stigma:—*all enlarged*; 5, *reduced* view of whole plant.

1

2

3

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TAB. 7780.

CALANTHE MADAGASCARIENSIS.

Native of Madagascar.

Nat. Ord. ORCHIDEÆ.—Tribe EPIDENDREÆ.

Genus CALANTHE, *Br.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 520.)

CALANTHE (Veratrifoliæ) *madagascariensis*; foliis paucis ad basin caulis confertis sessilibus v. petiolatis ellipticis v. ovato-oblongis acuminatis marginibus undulatis inter-nervos profunde impressos sublacunosis, pedunculo 6–12 poll. longo erecto robusto puberulo vaginis paucis laxis instructo, racemo brevi erecto laxe multifloro, bracteis lanceolatis acutis pedicellis paullo brevioribus viridibus, floribus 1–1¼ poll. latis, sepalis petalisque patentibus concoloribus albis margines versus purpureo suffusis, sepalis ellipticis acutis apicibus dorso viridibus, petalis paullo minoribus subacutis, labello sepalis paullo breviore plano trilobo ad ½ poll. longo et lato aureo lilacino v. purpureo 3-lobo, lobis lateralibus divaricatis oblongis v. lineari-oblongis apice rotundatis terminali late obcordato lobulis divaricatis, disco basi aureo tuberculis 2 majusculis verruccisque minoribus aucto, calcare gracili incurvo.

C. madagascariensis, *Rolfe mss.*

C. sylvatica, *Rolfe in Journ. Linn. Soc.* vol. xxix. (1891) p. 52, *non Lindl.*

Calanthe madagascariensis is a near ally of *C. veratrifolia*, Br. (tab. 2615) a species of very wide distribution, from North and South India to Japan and Australia. It differs from that plant in size, in the undulate leaves, in the much broader sepals and petals, and in the more verrucose disk of the lip with two large tubercles. The flowers vary much in colour; a prevalent variety has white sepals and petals, clouded with pink, and a rose-purple lip; others have pure white sepals and petals and a yellow lip.

Mr. Warpur, a Belgian collector, was the introducer into Europe of *C. madagascariensis*. The Royal Gardens, Kew, are indebted to him for the specimen here figured, which flowered in a warm house in August, 1890. There are others in the Kew Herbarium from the East Betsileo district, collected by the Rev. R. Baron, and from Fort Dauphin by Mr. Scott Elliot, M.A., F.L.S.

Descr.—*Pseudobulbs* small, clustered, cylindric, annulate. *Leaves* few, crowded, all radical, spreading and recurved, three to five inches long, sessile or shortly petioled, elliptic or oblong-ovate, acuminate; margins undulate;

upper surface raised between the nerves and pitted; under-surface deeply pitted. *Peduncle* six to twelve inches high, robust, puberulous, bearing a few lax sheaths. *Raceme* short, erect, many-flowered; bracts lanceolate, recurved, green. *Flowers* an inch or more in breadth. *Sepals* and *petals* alike, spreading, elliptic-ovate, acute; petals rather smaller, and more obtuse. *Lip* adnate to the top of the column, rather shorter than the sepals, flat, deeply three-lobed; lateral lobes spreading, oblong, tips rounded; terminal broadly obcordate, with spreading, rounded lobules, and an acute sinus; disk yellow, with two large tubercles, and many globose warts at the base; spur longer than the flower, slender, incurved. *Column* short, broad. —*J. D. H.*

Fig. 1, base of lip and column; 2, anther; 3, pollinia:—*all enlarged.*

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Tab. 7781.

NYMPHÆA FLAVO-VIRENS.

Native of Mexico?

Nat. Ord. Nymphæaceæ.—Tribe Nymphææ.

Genus Nymphæa, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 46.)

Nymphæa *flavo-virens*; foliis natantibus orbiculatis ad 10 poll. diam. grosse sinuato-crenatis basi sagittatis segmentis acutis, sinu clauso v. aperto supra laete viridibus unicoloribus v. nigro maculatis subtus pallidioribus brunneo suffusis v. atro-sanguineis, pedunculo longe emerso, floribus 5 poll. diam. suaveolentibus, sepalis oblongo-lanceolatis obtusis extus viridibus, petalis numerosis sepalis æquilongis v. paullo longioribus anguste lanceolatis subacutis, staminibus sub 3-seriatis, filamentis exterioribus lineari-oblongis, antheris fere pollicaribus longiuscule appendiculatis aureis, stigmatibus 12–14 conicis obtusis demum patentibus.

N. flavo-virens, *Lehm. Ind. Sem. Hort. Hamb.* 1852, p. 9, *et in Ann. Sc. Nat.* Ser. III. vol. xix. (1853) p. 361.

N. mexicana, *Hort.*, *non Zucc.*

Nymphæa flavo-virens is a near ally of the Mexican *N. gracilis*, Zucc., differing from that plant in its larger size, in the segments of the leaf being pointed, in the narrower, sub-acute (not acuminate) petals, in the filaments not being so dilated at the base, and in the more numerous stigmas. It has been long in cultivation in Europe, having been first described in 1852, from a plant that flowered in the Botanical Garden of Hamburg, and in July last a specimen was sent to be named by Mr. Moore, A.L.S., Keeper of the Glasnevin Botanical Garden. There is a specimen of it in the Kew Herbarium from the Hamburg Garden, named by Professor Caspary, who made a special study of the genus. This specimen has black blotches on the leaves, and the species is described as having the under surface of the leaves of a blood-red colour. In the Kew plant the leaves are very pale green beneath, clouded with brown; in Mr. Moore's they are also pale, but pure green.

The native country of *N. flavo-virens* is unknown, but is probably Mexico, both because of its affinity with *N. gracilis*, and because the Kew plant was received from W. N. Pike, of the Floral Park, New York (in 1892) as

"*N. mexicana* true." This last statement is an error, for *N. mexicana* belongs to a section of the genus with muticous anthers, and has, according to a description in the "Wiener Illustr. Gartenzeit.," 1889, p. 413, yellow flowers.

Descr.—*Leaves* orbicular, six to ten inches broad, coarsely sinuate-crenate, bifid at the base nearly to the centre; segments with pointed tips, sides parallel or divaricate, bright green above, paler beneath. *Flowers* five inches broad. *Sepals* oblong-lanceolate, obtuse, externally yellowish green, white within. *Petals* narrowly lanceolate, tips sub-acute. *Stamens* nearly an inch long; filaments of the outer oblong; anthers longer than the filaments, narrow, terminated by an acute elongation of the connective, golden-yellow. *Stigmas* twelve to fourteen, conical, obtuse. —*J. D. H.*

Fig. 1 and 2, stamens; 3, *enlarged*; 4, stigmas, of the *natural size.*

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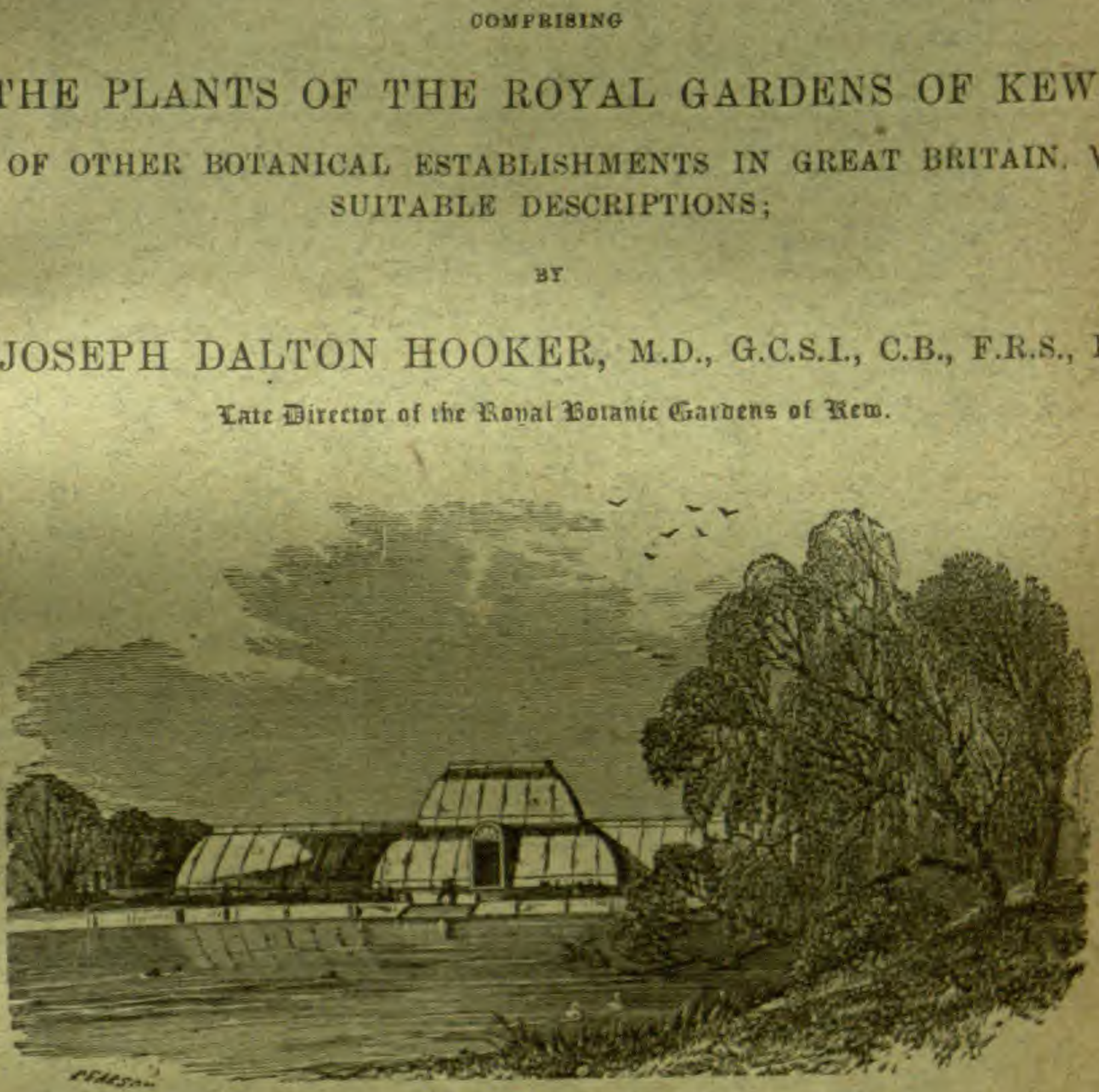

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Tab. 7782.

RHODODENDRON ciliicalyx.

Native of China.

Nat. Ord. Ericaceæ.—Tribe Rhodoreæ.

Genus Rhododendron, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 599.)

Rhododendron (Eurhododendron) *ciliicalyx*; arbuscula, foliis coriaceis 3–4 poll. longis ellipticis v. obovato-lanceolatis utrinque acutis supra pallide viridibus subtus glaucescentibus squamulis minutis brunneis lepidotis, junioribus basi ciliatis, nervis utrinque 6–8 subtus prominulis, petiolo brevi robusto lepidoto pilis deciduis hirsuto, floribus 3–10 corymbosis mox cernuis, bracteis parvis cymbiformibus ciliatis brunneis, pedicellis brevibus calycibusque dense lepidotis, calycis cupularis $\frac{1}{6}$ poll. longi lobis rotundatis erectis longe setoso-ciliatis, corolla 4 poll. lata alba v. roseo suffusa e basi breviter tubulosa aperte campanulata extus inferne parce lanuginosa 5–6-loba, lobis rotundatis marginibus undulatis, staminibus 10–12, filamentis leviter declinatis basin versus pilosis, ovario oblongo-ovoideo 5-loculari dense lepidoto, stylo gracili glabro, stigmate capitato.
R. ciliicalyx, *Franch. in Bull. Soc. Bot. France*, vol. xxxiii. (1886) p. 233.
Hemsl. in Journ. Linn. Soc. Bot. vol. xxvi. (1889) p. 21.

The plant here figured is closely allied to the Indian *R. formosum*, Wall. (see tab. 4457), and may indeed have to be considered as a form of that plant. In the absence of fruit, however, it would be premature to pronounce upon a species established by so excellent a botanist as the late Mr. Franchet. The most prominent characters of *R. ciliicalyx*, as distinguished from *R. formosum*, are, its robust habit, larger flowers, and the long bristle-like cilia on the lobes of the calyx. Unfortunately the calyx of *R. formosum* is an exceedingly variable organ in development, and in being glabrous, hairy, or hirsute; and there is in the Kew Herbarium a robust form of it, collected by Dr. Watt in Muneypore and the Naga Hills, at elevations of six thousand to nine thousand feet, and called by him *R. Johnstoneanum*, in which the calyx is represented by a ring of bristles, like those of the calyx-lobes of *R. ciliicalyx*.

R. ciliicalyx is a native of the Teechapo mountains of Yunnan, near Mo-so-yn, at an altitude of seven thousand four hundred feet, where it was discovered by the Abbé Delavay, who sent seeds of it to the Jardin des Plantes,

Paris. From these plants were raised and distributed, one of which, received in 1892 at the Royal Gardens, Kew, from the late Prof. Max Cornu, flowered in the Himalayan division of the Temperate House in May, 1900, being then three feet high.

Descr.—A nearly glabrous shrub, or small tree, with robust branches. *Leaves* coriaceous, three to four inches long, elliptic or obovate-lanceolate, acute at both ends, pale green and smooth above, beneath glaucous, and covered with scattered, minute, broad, lepidote scales; petioles short, stout, and often the leaf-base also, ciliate, with long hairs. *Flowers* three to ten, in a terminal, very shortly peduncled corymb; bracts short, oblong, brown, ciliate; pedicels short, lepidote. *Calyx* about one-sixth of an inch long, cupular, five-lobed, lepidote; lobes rounded, ciliate, with long, erect, unequal bristles. *Corolla* with a short tube, dilating into an infundibular campanulate, five- to six-lobed limb, which is four inches broad across the lobes, white, or suffused with pale rose; lobes rounded, margins undulate; base externally more or less woolly. *Stamens* sub-declinate, hairy from below the middle to the base. *Anthers* small. *Ovary* densely lepidote, five-celled; style glabrous. *Stigma* capitate.

Fig. 1, portion of *under-surface of leaf with lepidote scales*; 2, calyx and ovary; 3, scale from do.; 4, and 5, stamens:—*all enlarged*.

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TAB. 7783.

CHELONOPSIS MOSCHATA.

Native of Japan and China.

Nat. Ord. LABIATÆ.—Tribe STACHYDEÆ.

Genus CHELONOPSIS, *Miq.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 1204.)

CHELONOPSIS *moschata*; herba moschum spirans, rhizomate lignoso, caule subsimplici ascendente annotino 4-gono puberulo, foliis 3–6 poll. longis breviter petiolatis ovato-lanceolatis acuminatis serratis supra saturate viridibus marginibus purpureis floralibus conformibus, verticillastris pauci-laxifloris, bracteis bracteolisque linearibus, floribus 1½ poll. longis patulis, calyce inflato campanulato breviter bilabiato 5-dentato puberulo fructifero accrescente dentibus erectis, corolla calyce triplo longiore roseo-purpurea, tubo fere a basi ampliato tereti labiis brevibus patulis postico retuso anticique lobis lateralibus pallide flavidis, antici lobo terminali ceteris multo majore roseo, filamentis gracilibus erectis basin versus hirsutis, antheris parvis fasciculis stellatis 3 pilorum ornatis quorum uno ad apicem antheræ duo ad basin loculorum sitis disco postice tumido, styli glaberrimi lobis inæqualibus subulatis, nuculis basi calycis aucti campanulati sessilibus oblongis lata alatis atris.

C. moschata, *Miq. in Ann. Mus. Lugd. Bat.* vol. ii. (1865) p. 111. *Maxim. Mel. Biol. Dec.* ix. p. 443. *Franch. & Sav. Enum. Pl. Jap.* vol. i. p. 378. *Hemsl. in Journ. Linn. Soc.* vol. xxvi. (1890) p. 298.

The genus *Chelonopsis* consists of two species, that here figured and *C. Benthamiana*, Hemsl., a native of China. It is allied to the beautiful *Melittis Melissophyllum* (the Bastard Balm of the British Flora) which it resembles in its lax axillary inflorescence and large flowers, but from which it differs in the lobing of the calyx, which is greatly enlarged in fruit, and contains nutlets and seeds of a very different character from those of *Melittis*. The singular tufts of stellate hairs on the anthers of *C. moschata* do not occur in the European genus.

C. moschata is a native of the mountains of the interior of Japan, at elevations of two thousand to seven thousand feet, and of those of Ningpo in China. It is described by Mr. Hemsley as very variable in the shape and toothing of the leaves. The specimen figured was raised from seeds sent to the Royal Gardens, Kew, in 1898, by A. K. Bulley, Esq., of West Kirby, which flowered, when two feet high, in October, 1900, in the Temperate House, but did not mature seed.

JULY 1ST, 1901.

Descr.—A perennial herb, with musky odour. *Rootstock* woody. *Stem* ascending, four-angled, puberulous. *Leaves* three to six inches long, shortly petioled, ovate-lanceolate, acuminate, finely or coarsely serrate, green, with purple margins; floral leaves like the cauline, but smaller. *Flowers* few, in loose, false-whorls. *Bracts* and bracteoles linear. *Calyx* campanulate, shortly two-lipped, 5-toothed, puberulous, much enlarged, and thinly coriaceous in fruit. *Corolla* an inch and a half long; tube terete, ventricose from the base upward; tips short, spreading, the posticous and lateral lobes of the anticous lip pale yellow, terminal much the largest, rose-purple-coloured. *Filaments* slender, erect, hirsute towards the base; anthers small, with a star-like fascicle of hairs at the top, and one at the base of each cell. *Fruiting calyx* one half to three-fourths of an inch long, oblong-campanulate, coriaceous, striate. *Nutlets* one-third of an inch long; produced upward into a coriaceous wing. *Seed* orbicular, compressed, black.—*J. D. H.*

Fig. 1, calyx; 2, base of corolla and stamens; 3 and 4, front and back views of anthers; 5, disk and pistil:—*all enlarged.*

M.S. del. J.M. Fitch lith.

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Tab. 7784.

IRIS chrysantha.

Native of Persia?

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 686.)

Iris (Pogoniris) *chrysantha*; rhizomate breviter repente, foliis linearibus crassis erectis pedalibus glaucescentibus margine stramineis, pedunculo elongato monocephalo, spathæ valvis magnis lanceolatis acuminatis chartaceis pallide viridibus, perianthii magni pallide lutei tubo cylindrico pollicari, segmentis exterioribus oblongis emarginatis e basi recurvatis deorsum conspicuo barbatis, segmentis interioribus latioribus erectis obovatis, ovario magno clavato distincte stipitato, styli ramis latis cristis quadratis integris.

This fine species of *Iris* belongs to the section *Pogoniris*, and is easily distinguished from the species already known by its narrow leaves, long peduncle with a single cluster of flowers, large spathe-valves and large, pale yellow flower, with a short tube. Its native country is rather uncertain. Kew received it from Mr. R. I. Lynch of the Cambridge Botanic Garden, with whom it flowered last June. He received it from Mr. C. G. Van Tubergen, Jr., of the Zwanenburg Nurseries, Haarlem, under the name of *Oncocyclus*, species. Mr. Van Tubergen has not himself flowered it, and it seems likely that it was introduced accidentally, along with a fine new species of the *Oncocyclus* section, which he has lately distributed under the name of *Iris urmiensis*, and which was collected in the neighbourhood of Lake Urmiah, in North-west Persia.

Descr.—*Rhizome* shortly creeping. *Leaves* linear, a foot long, erect, glaucescent, thick and firm in texture, with a narrow, pale margin. *Stem* slender, as long as the leaves, bearing a single terminal cluster of flowers. *Spathe-valves* lanceolate-acuminate, four inches long, pale green, chartaceous. *Perianth* pale yellow, with a cylindrical tube above the ovary, nearly an inch long; outer segments oblong, emarginate, three inches long, reflexing from near the base, furnished in the lower half with a bright yellow beard; inner segments erect, obovate-cuneate, as long as

the outer, and rather broader. *Ovary* distinctly stipitate, clavate, narrowed gradually to both ends, not distinctly ribbed; style-branches convex, an inch broad, the same colour as the perianth; crests large, quadrate, entire.—*J. G. Baker*.

Tab. 7784, whole plant, *life size*.

M.S.del J.N.Fitch lith

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TAB. 7785.

CYANOTIS HIRSUTA.

Native of Abyssinia.

Nat. Ord. COMMELINACEÆ.—Tribe TRADESCANTIEÆ.

Genus CYANOTIS, *D. Don.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 851.)

CYANOTIS (Eucyanotis) *hirsuta*; tuberibus globosis, caulibus erectis ramosis foliisque laxe villosis v. glabratis, foliis 2–12 poll. longis ¼–¾ poll. latis linearibus ciliatis, spicis densifloris terminalibus et axillaribus sessilibus v. breviter pedunculatis, bracteis foliaceis lineari-lanceolatis ciliatis spicas sæpissime longe superantibus, bracteolis oblongis falcatis acutis viridibus ciliatis, calyce ad medium 3-fido lobis ovatis acutis, petalis roseis unguibus basin prope connatis lamina fere orbiculari ½ poll. diam., filamentis usque ad apices pilis azureis dense barbatis, antheris minutis aureis, ovario oblongo styloque villoso, capsula clavata 3-loba glabra valvulis placentæ unitis axi centrali 0, seminibus quadrato-pyramidatis obscure foveolatis et rugosis.

C. hirsuta, *Fisch. Mey. & Avé-Lall. Ind. Sem. Hort. Petrop.* vol. viii. (1841) p. 57. *Clarke in A. & C. DC. Monog. Phan.* vol. iii. p. 254, *et in Fl. Trop. Afr.* vol. viii. *ined.*

C. abyssinica, *A. Rich. Fl. Abyss.* vol. ii. p. 344, tab. 98. *Hassk. Commel. Ind.* p. 139.

Commelina hirsuta, *Hochst. in Herb. Abyss. Schimp.* n. 14, *non aliorum.*

Zygomenes abyssinica, *Hassk. in Schweinf. Beitr. Fl. Æthiop.* p. 211.

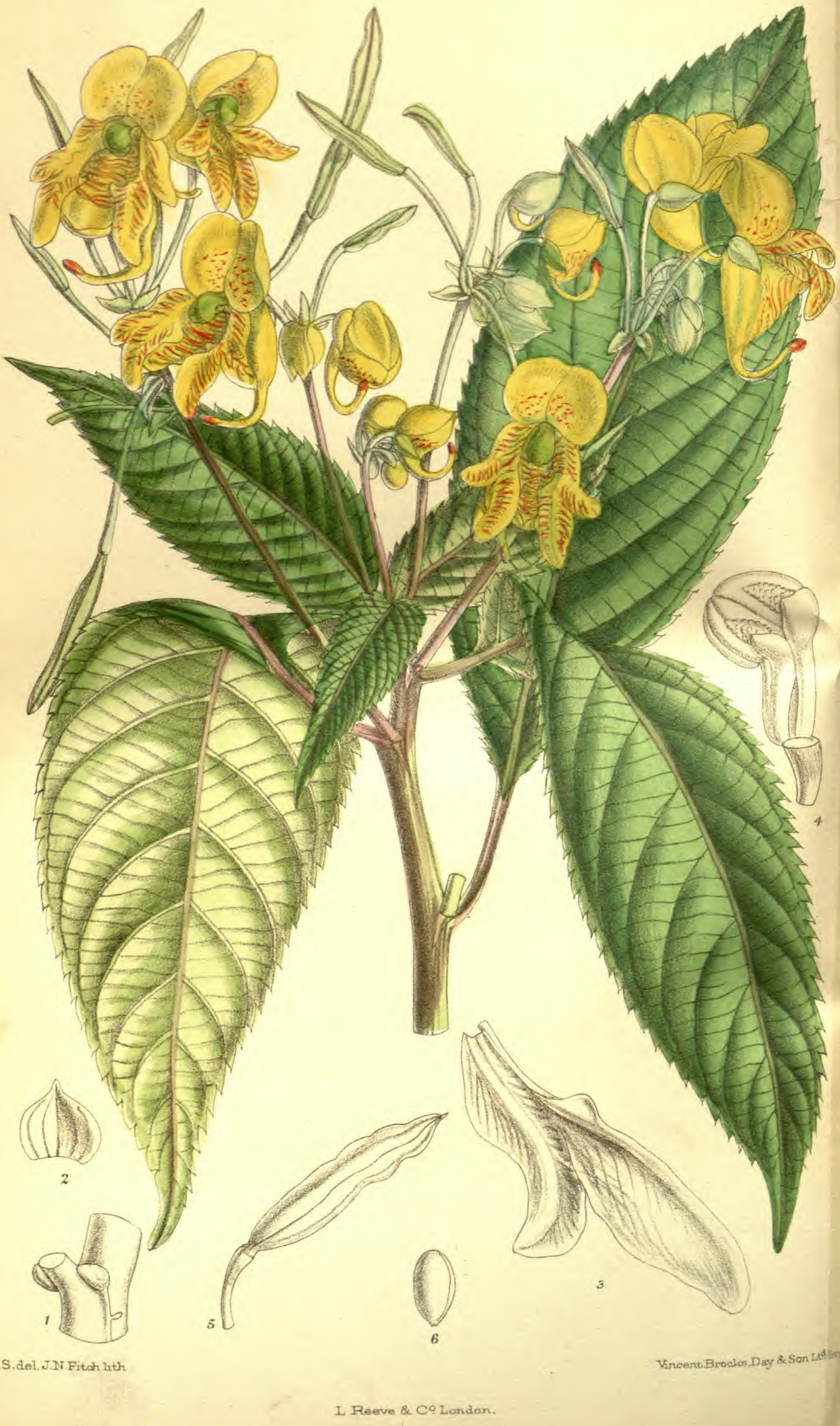
Cyanotis hirsuta was discovered on Mt. Chiré, near Adoa, in Abyssinia, in about 1840, by Schimper, who describes it as having eatable tuberous roots, about the size of a chestnut, called Burko by the natives. Tubers were presented to the Royal Gardens, Kew, by A. B. Wylde, Esq., the Abyssinian traveller, who collected them at a high elevation, where the plant is said to be abundant. The species is very variable in size, and in the length and breadth of the leaves. It flowered almost throughout the year in a greenhouse.

Descr.—*Tubers* globose, an inch or more in diameter. *Stem* erect, a foot or more high, branched, and leaves and bracts villous, with soft hairs. *Leaves* two to twelve inches long by a quarter to three-fourths of an inch broad, linear, flaccid. *Spikes* terminal and axillary, sessile, or shortly peduncled, much shorter than the leaf-like bracts; bracteoles densely imbricate, oblong, falcate, acute, green, ciliate. *Calyx* 3-lobed to the middle; lobes ovate, acute.

JULY 1ST, 1901.

Petals with long, nearly free claws; blade orbicular, rose-coloured, half an inch broad. *Filaments* densely bearded throughout their length with articulate azure hairs; anthers minute, golden-yellow. *Ovary* oblong; style villous. *Capsule* clavate, three-lobed, valves confluent with the placentas leaving no free axis where the capsule dehisces. *Seeds* pyramidal, four-sided, obscurely pitted.—*J. D. H.*

Fig. 1, bract with spike after the fall of the corollas and stamens; 2, calyx; 3, stamen; 4, pistil; 5, hair from stamen; 6, seed:—*all enlarged.*



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TAB. 7786.

IMPATIENS CHRYSANTHA.

Native of the Western Himalaya.

Nat. Ord. GERANIACEÆ.—Tribe BALSAMINEÆ.

Genus IMPATIENS, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 277).

IMPATIENS *chrysantha*; annua, glaberrima, caule crassiusculo ramoso, foliis alternis ovato-oblongis-lanceolatisve acuminatis serratis crenatisve basi in petiolum angustatis, glandulis stipularibus turgidis, pedunculis apices versus ramorum subcorymbosis erectis, floribus majusculis umbellatis aureis, bracteis $\frac{1}{6}$ poll. longis verticillatis ovatis subacutis herbaceis, pedicellis $\frac{1}{2}$–$\frac{3}{4}$ poll. longis, sepalis lateralibus 2 $\frac{1}{10}$–$\frac{1}{8}$ poll. longis late ovatis vix cuspidatis, postico (labio) saccato v. late infundibulari in calcem incurvum abrupte attenuato, petalo antico (vexillo) orbiculari v. transverse oblongo apice retuso cuspidato dorso gibbo incrassato, lateralibus (petalis) rubro striolatis, lobo basilari superne in lobulum falcatum patenti-recurvum producto, terminali oblongo obtuso, auricula dorsali rotundata, capsulis 1–1$\frac{1}{2}$-pollicaribus linearibus erectis, seminibus $\frac{1}{8}$–$\frac{1}{7}$ poll. longis obovoideis oblongisve lævibus fuscis.

The genus *Impatiens* abounds in the temperate and subtropical regions of the Himalaya, and contains many singularly beautiful species that have not been brought under cultivation in England. Amongst these is *I. chrysantha*, which inhabits forests at elevations of five thousand to eight thousand feet, from the district of Pangi, on the Sutlej river, north of Simla, to Kashmir, and westward to Mirza, in Chitral, where it was collected by Colonel (now General) Gatacre, K.C.B.

It is a variable plant as to the margins of the leaves, which are coarsely crenate, with lateral or basal cusps on the crenatures, or serrate with terminal cusps. It varies also in the form of the lip, and size and form of the seeds A closely allied species is *I. Edgeworthii*, Hook. f., & Thoms., a native of Kulu (a province bordering on Kashmir), which differs in the much larger lateral sepals, with the midrib thickly keeled dorsally.

I. chrysantha was raised from seeds collected in Pangi, and sent from the Saharunpore Gardens to Kew by Mr. Duthie early in 1900, plants raised from which flowered profusely in the Herbaceous ground in October of the same year, and fruited abundantly.

JULY 1ST, 1901.

Descr.—An annual, glabrous herb, two to three feet high, with rather stout, branched, terete, succulent stems. *Leaves* alternate, three to six inches long, acute or acuminate, crenate with terminal or lateral cusps on the crenatures, or serrate with terminal cusps; petiole of lower leaves long, of upper short; stipular glands globose. *Peduncles* numerous, corymbosely disposed towards the tips of the stem and branches, naked below, terminated by short racemes, of which the flowers are often more or less whorled, or sub-umbellate; bracts ovate or ovate-lanceolate; pedicels one half to one and a half inches long. *Flowers* golden-yellow. *Sepals* small, ovate or sub-orbicular, one-tenth to one-eighth of an inch long, obtuse or obtusely cuspidate. *Standard* orbicular, two-lobed, costa dorsally thickened or subalate. *Wings* with basal lobe produced upwards as a third lobe or lobule, terminal dolabriform; dorsal auricle rounded. *Lip* two-thirds of an inch long, exclusive of the incurved spur, infundibular or saccate. *Ovary* with a long beak. *Capsules* an inch to an inch and a half long, sub-erect, linear, obtuse, torulose, few- or many-seeded. *Seed* obovoid-oblong or orbicular, compressed, nearly smooth—*J. D. H.*

Fig 1, portion of stem with base of petiole and stipulary glands; 2, sepal; 3, wing-petal; 4, stamens; 5, capsule; 6, seed:—*all enlarged.*

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Tab. 7787.

BULBOPHYLLUM GRANDIFLORUM.

Native of New Guinea.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Bulbophyllum, *Thou.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 501.)

Bulbophyllum (Eubulbophyllum) *grandiflorum*; caudice valido repente, pseudobulbis distantibus prismaticis monophyllis, folio 5–10 poll. longo 1–2 poll. lato elliptico v. lineari-oblongo apice emarginato basi in petiolum brevem angustato crasse coriaceo supra saturate viridi lucido costa subtus obtuse carinata, scapo folio breviore robusto unifloro vaginis paucis laxis instructo, bractea pollicari spathacea, flore ad 8 poll. longo, pedicello robusto cum ovario bractea subduplo longiore, sepalis maximis multinerviis internervos plagis pallide brunneis albisque tessellatis, dorsali late ovato-oblongo obtuso arcuatim incurvo lateribus recurvis, lateralibus lineari-oblongis obtusis deflexis ultra medium incurvis, petalis minimis triangularibus, labello minuto trilobo, lobis lateralibus orbiculatis, terminali linguæformi crasso profunde sulcato sanguineo punctato marginibus basin versus longe ciliatis, columna crassa antice truncata apice contracta, anthera hemisphærica, polliniis 4, 2 dimidiato-oblongis, 2 minutis facie interiore majorum adnatis.

B. grandiflorum, *Blume, Rumphia*, vol. iv. p. 42 (*non Rchb. f.*); *Rolfe in Orchid Rev.* vol. iii. p. 104; *in Gard. Chron.* 1895, vol. i. p. 422, fig. 429.

B. burfordiense, *Hort. ex Orchid Rev.* vol. iii. p. 135.

Ephippium grandiflorum, *Blume*, l.c. t. 195, fig. 3 and t. 199, fig. B.

The gigantic *Bulbophyllum* here figured was discovered in New Guinea by Zippel, a naturalist who, in 1828, accompanied an expedition consisting of two ships (the *Triton* and *Iris*), which was commissioned by the Dutch Government, under the command of Dr. Marklot, to establish a civil and military settlement in that Archipelago. It is remarkable for the colouring of the sepals, the contrast between the size of these and the minuteness of the petals which are only a small fraction of an inch long and broad. The pollinia are peculiar, though perhaps not normally developed in the cultivated plant; they are four in number, two large, oblong and strongly compressed, and two very minute attached to the inner faces of the larger. Its only near ally is *B. Cominsii*, Rolfe, a native of the Solomon Islands, the flower of which is much smaller.

August 1st, 1901.

B. grandiflorum was introduced into cultivation before 1895, when a flowering specimen was exhibited at the Royal Horticultural Society by Sir Trevor Lawrence. The specimen here figured was purchased for the Royal Gardens, Kew, in 1898, from Messrs. F. Sander & Co. It flowered in a tropical orchid house in October, 1900, and the flower lasted for three days.

Descr.—*Rootstock* creeping, as thick as a small goose-quill, nodes with short sheaths. *Pseudobulbs* prismatic, two to three inches long, sheathed. *Leaf* seven to ten inches long by one to two broad, very coriaceous, obtuse, tip emarginate, base narrowed into a short petiole, bright green and shining above, costa dorsally obtusely keeled. *Peduncle* six to eight inches long, suberect, stout, bearing two to three broad sheaths, one-flowered. *Bract* one and a half inch long, spathaceous, obtuse, green; pedicel with ovary three inches long. *Perianth* about eight inches long. *Sepals* very broad, many-nerved, tessellated with alternating large pale brown and yellow spots, which are orbicular quadrate or oblong and placed between the nerves. *Dorsal sepal* broadly ovate-oblong, obtuse, arcuate, and incurved (sickle-shaped), sides reflexed, keeled dorsally; lateral sepals deflexed, linear-oblong, incurved and conniving beyond the middle. *Petals* very minute, triangular. *Lip* minute, three-lobed, lateral lobes orbicular, terminal, linguiform, deeply channelled above, spotted with red, margins ciliate towards the base. *Column* short, stout. *Anther* hemispheric.—*J. D. H.*

Fig. 1, flower with the sepals removed; 2, petal; 3, anther; 4 and 5, pollinia:—all greatly *enlarged*.

3

2

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M.S.del. J.N.Fitch lith.

Vincent Brooks Day & Son Lith Imp

Tab. 7788.

Pæonia lutea.

Native of China.

Nat. Ord. Ranunculaceæ.—Tribe Pæonieæ.

Genus Pæonia, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 10.)

Pæonia *lutea*; suffrutex glaberrimus, caule brevi lignoso, foliis ternatisectis coriaceis valide nervosis subtus glaucescentibus, segmentis obovato-oblongis basi cuneato-decurrentibus petiolulatis v. confluentibus supra medium varie incisis et lobulatis, floribus ad apices ramulorum solitariis 2–4 poll. latis, sepalis extimis foliaceis lineari-lanceolatis acuminatis intimis orbicularibus valde concavis longe cuspidatis flavo-virescentibus, petalis 6–10 orbiculatis concavis aureis integris v. extimis irregulariter crenatis, filamentis brevibus, antheris lineari-elongatis aurantiacis, disco crasso lobato, carpellis 3 turgidis glaberrimis, stylis brevibus recurvis, carpellis maturis $\frac{1}{2}$ poll. longis dehiscentibus cymbiformibus, seminibus ovoideis angulatis brunneis.

P. lutea, *Franch. in Bull. Soc. Bot. France*, vol. xxxiii. (1886) p. 382. *Henry in Le Jardin*, 1897, p. 216 cum ic.; *in Journ. Soc. Nat. d'Hortic.* Ser. III. vol. xiv. p. 320, et xv. p. 274. *Gard. Chron.* 1900, vol. i. p. 404 *in nota.*

Pæonia lutea is an interesting species on account of its woody stem and yellow flowers, both rare characters in the genus. In the first of these it resembles the Chinese *P. Moutan*, Sims (tab. 2175), and in the second only *P. Wittmanniana*, Stev. (tab. 6645), the yellow in the petals of which latter is, however, more inclined to white.

The figure of *P. lutea* here given was taken from a plant sent from the Jardin des Plantes, Paris, by the late Professor Cornu to the Royal Gardens, Kew, where it flowered in the Himalayan division of the Temperate House in June, 1900. It is a native of the mountains of Yunnan, where it was discoved by the Abbé Delavay in 1882. Single and double flowers occur in both native and cultivated specimens.

Descr.—Quite glabrous. Stem short, woody. *Leaves* ternatisect, coriaceous, strongly nerved, glaucous beneath; segments obovate-oblong, petiolulate or confluent below, incised or lobulate beyond the middle. *Flowers* terminal, solitary, two to four inches broad. *Sepals*, outer foliaceous, linear-lanceolate, acuminate, inner orbicular,

concave, cuspidate, yellowish green. *Petals* six to ten, orbicular, concave, golden yellow, entire or the outer crenate. *Anthers* linear, yellow. *Carpels* three, turgid, glabrous, cymbiform after dehiscence. *Seeds* ovoid, angular, brown.—*J. D. H.*

Figs. 1 and 2, stamens enlarged; 3, disk and imperfect carpels of *natural size.*

M.S. del. J.N. Fitch lith.

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Tab. 7789.

HELICHRYSUM Gulielmi.

Native of Eastern Tropical Africa.

Nat. Ord. Compositæ.—Tribe Inuloideæ.

Genus Helichrysum, *Gærtn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 309.)

Helichrysum (Xerochlæna) *Gulielmi*; herba perennis, robusta, foliosa lanuginosa, foliis 3–5 poll. longis sessilibus oblongo- v. lineari-lanceolatis obtusis inferioribus recurvis superioribus patulis, costa subtus crassa, capitulis corymbosis pedicellatis 1–1½ poll. latis, pedicellis robustis bracteatis, involucri bracteis numerosis multiseriatis albis v. extus roseis intus albis exterioribus brevibus lanceolatis patulis interioribus gradatim longioribus ½–⅔ poll. longis lineari-lanceolatis acuminatis patenti-incurvis, receptaculo latiusculo ½ poll. lato planiusculo glabro nudo, disci latiusculi aurei floribus extimis paucis fœmineis anguste tubulosis, ceteris masculis numerosis breviter 5-dentatis, antherarum caudiculis ciliatis, pappi setis sigillatim deciduis scaberulis, acheniis brevibus glabris.

H. Gulielmi, *Engler, Ueber die Hochgebirgsflora des trop. Afrik.* p. 426 (1892). *Gumbleton in Gard. Chron.* 1900, vol. ii. p. 333, fig. 103.

The very handsome plant here figured is a conspicuous member of the flora of Kili-manjaro in German East Africa, where it is found with two other species at elevations of 5000 to upwards of 9000 ft. The genus *Helichrysum* is characteristic of the vegetation of the loftiest mountains of tropical Africa, several inhabiting the Cameroon mountains in the Gulf of Guinea, one of which, *H. Mannii*, is figured on Tab. 5431 of this work. Others are found on Mt. Kenia in British East Africa, and a considerable number may be expected to occur on the lofty and snow-capped range of Ruwenzori in Uganda.

I am indebted to W. Gumbleton, Esq., of Belgrove, Co. Cork, for the specimen here figured of *H. Gulielmi*, which, together with the two other species from the same locality, he raised from seeds which were collected by Dr. Hans Meyer of Leipsic, and distributed by Mr. Max Leichtlin. Mr. Gumbleton informs me that it attains a height of two feet, one specimen bearing six branches, each with fourteen to eighteen flower-heads, to be followed by others. It flowered in a greenhouse, in October, 1900,

August 1st, 1901.

and continued to flower for about three months. The name it bears is that of the German Emperor.

Descr.—A robust, leafy, branching, perennial herb, about two feet high, covered, with the exception of the flower-heads, with white wool. *Leaves* three to five inches long, sessile, linear-oblong or -lanceolate, obtuse, lower recurved, midrib stout, beneath. *Flower-heads* corymbose, an inch to an inch and a half broad; pedicels stout, bracteate. *Involucre* hemispheric; bracts in many series, linear, outer short, spreading, inner linear-lanceolate, an inch to an inch and a half long, spreading and incurved, white or rose-red on the outer surface. *Receptacle* half an inch broad, glabrous. *Florets* all tubular, outer series few, female, the rest male. *Anther* cells with ciliate tails. *Pappus hairs* scaberulous. *Achenes* short, glabrous.—*J. D. H.*

Fig. 1, inner involucral bract; 2, male flower; 3, pappus-hair; 4, anthers; 5, style-arms of female flower:—*all enlarged.*

M.S del. J.N. Fitch lith.

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Tab. 7790.

STROBILANTHES GOSSYPINUS.

Native of the Nilghiri Hills.

Nat. Ord. Acanthaceæ.—Tribe Ruellieæ.

Genus Strobilanthes, *Blume*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 1086.)

Strobilanthes (Endopogon) *gossypinus*; frutex erectus, tomento fulvo dense lanuginoso, ramis tetragonis, foliis subcoriaceis 3–7 poll. longis ovatis ellipticisve acutis v. acuminatis supra demum glabrescentibus, nervis utrinsecus 10–13 confertis subtus validis, petiolo 1–1½ poll. longo robusto, spicis apices versus ramorum paniculatis brevibus oblongis 3–6-floris, bracteis ⅔–½-poll. longis ellipticis obtusis, bracteolis lineari-oblongis, calycis ½-poll. longi segmentis erectis lineari-lanceolatis inæqualibus intus glabris, corolla ¾-poll. longa oblonga oblique ventricosa basi in tubum brevem curvum angustata intus postice fascia decurrente pilosa instructa, lobis patulis subæqualibus pallide cœruleis, staminibus 2 inclusis, filamentis laxe pilosis, ovario glabro apice piloso, stylo glaberrimo, stigmate lineari decurvo.

S. gossypinus, *T. Anders. in Journ. Linn. Soc. Bot.* vol ix. (1867) p. 466. *Clarke in Fl. Brit. Ind.* vol. iv. p. 434. *Bedd. Ic. Pl. Ind. Or.* p. 45, tab. 198.

Though a native of so long and well known an Indian botanical station as Sisparah Ghat, in the Nilghiri Hills, *Strobilanthes gossypinus* seems to have escaped the notice of Wight and all collectors, till Thos. Lobb found it at the above locality, and sent dried specimens to Messrs. Veitch, which are now preserved in the Kew Herbarium. It appears to be a rare plant, for except from Col. Beddome, who published an excellent figure and description of it in his "Icones," cited above, there are no other specimens at Kew. That botanist gives "common about Sisparah, at 4–5000 ft.," as the one localized habitat, though adding that he "has specimens from other localities in our Western Mountains."

As with others of its congeners, a plant of *S. gossypinus* flowers only once in its lifetime, on reaching its maturity, which in its native country takes six or seven years, and then dies. Col. Beddome mentions 1869 as one such year. The specimen here figured is from a plant now four feet high and wide growing in the Mexican division of the Temperate House of the Royal Gardens, Kew. It was

raised from seed sent by the late Mr. Jamieson, of Ootacamund, in 1887, and flowered for the first and last time in November, 1900. It has hence, according to Col. Beddome's estimate, taken twice as long a period to mature at Kew as it would have done had it grown in the Nilghiri Hills.

Descr.—An erect shrub, covered with a matted fulvous tomentum. *Branches* four-angled. *Leaves* three to seven inches long, ovate or elliptic, acute or acuminate, at length glabrous on the upper surface; nerves about twelve pairs, arched, close-set; petiole stout. *Spikes* panicled towards the ends of the branches, oblong, few-flowered; bracts elliptic, obtuse; bracteoles linear-oblong. *Calyx* half an inch long, segments unequal, linear-lanceolate, erect. *Corolla* about three-quarters of an inch long, gibbously ventricose, contracted below into a short curved tube; lobes subequal, spreading, pale blue. *Stamens* 2, filaments sparsely hairy; anthers included. *Ovary* and *style* glabrous; stigma linear, decurved.

Fig. 1, calyx with style and stigma; 2, corolla laid open showing stamens; 3 and 4, anthers; 5, disk and ovary:—*all enlarged.*

M.S. del, J.N. Fitch lith

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Tab. 7791.

GLADIOLUS sulphureus.

Native of the Transvaal.

Nat. Ord. Irideæ.—Tribe Ixieæ.

Genus Gladiolus, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 709.)

Gladiolus (Eugladiolus) *sulphureus*; caule 1–1½ pedale, foliis 1½–2-pedalibus ensiformibus medio ad 1 poll. latis firmis pallide viridibus nervis prominulis inæqualibus costatis, floribus 6–8 suberectis secundis pallide aureis viridi tinctis, spica erecta, rhachi valido, spathæ valvis exterioribus 1½-2 poll. longis lanceolatis erectis viridibus, perianthii tubo 1½-pollicari anguste infundibulari paullo decurvo, limbi segmentis tubo æquilongis oblongis obtusis apiculatisve patenti-recurvis interioribus paullo minoribus, staminibus tubo corollæ longioribus, antheris fere ½ poll. longis linearibus arcuatis sulphureis, stigmatibus clavellatis recurvis.

G. sulphureus, *de Graaf ex Molkenb. in Jaarboek Tuinbouw*, 1850, p. 39, *cum ic. color.* (*non Baker*).

G. Adlami, *Baker in Gard. Chron.* 1889, vol. i. p. 233; *Handb. of Irid.* p. 219; *in Dyer, Fl. Capens.* vol. vi. p. 156.

The publication of this very distinct species of Gladiolus in the Jaarboek Tuinbouw so long ago as 1850, has been overlooked hitherto by all succeeding authorities, though it was accompanied by an excellent coloured figure. It does not appear in the "Kew Index," the periodical in which it is described being so very rarely occupied with the description of new species of plants that it was not consulted during the laborious search for names involved in the preparation of the "Index." There is, however, an excellent specimen of the plant bearing the above name in the Kew Herbarium, presented in 1893 by Mr. Max Leichtlin, which was raised from Cape seed twenty years earlier.

Mr. Molkenboer, the author of the article in the Jaarboek, who cites de Graaf as the author of the species, regards it as a hybrid between *G. floribundus* and *natalensis*, alluding no doubt to the *floribundus* of the Dutch gardens (= G. flabellifer, *Tausch.*) and *natalensis*, Reinw., which is a synonym of *G. psittacinus*. That this is an error is now clear.

In the description in "Flora Capensis" of *G. Adlami*,

the upper perianth-segment is said to be "granulated all over with minute red dots." These were not observed in the specimen here figured, though a red spot may be seen at the junction of the segments.

G. sulphureus is a native of the Transvaal. Corms of it, from one of which was produced the specimen here figured, were obtained by the Royal Gardens, Kew, in 1900, from Mr. Max Leichtlin. It flowered in a cool house in July of the same year.

Descr.—*Stem* a foot to a foot and a half high. *Leaves* one and a half to two feet long, about an inch broad in the middle, ensiform, erect, strict, firm, strongly nerved. *Flowers* six to eight, subsecund, pale golden yellow faintly tinged with green; rhachis of spike stout, erect; spathe-valves lanceolate, acuminate, green. *Perianth-tube* slightly decurved, two inches long, narrowly infundibular above; segments about as long as the tube, oblong, obtuse or apiculate, spreading and recurved. *Filaments* longer than the perianth-tube; anthers about half an inch long, linear, curved. *Style* decurved; stigma recurved, clavellate.—*J. D. H.*

Figs. 1 and 2, stamens; 3, stigma; *both enlarged.*

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Tab. 7792.

EPIDENDRUM OSMANTHUM.

Native of Brazil.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Epidendrum, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 528.)

Epidendrum (Encyclium) *osmanthum*; pseudobulbis 3–5 poll. longis obpyriformibus teretibus 2-phyllis vaginis scariosis tectis demum nudis, foliis 8–18 poll. longis 1½-poll. latis sessilibus loriformibus apice rotundatis corinceis enerviis medio sulcatis costa subtus gracili, scapo gracili fusco-viride roseo maculato laxe paniculatim ramoso ramis elongatis apices versus paucifloris, bracteis brevissimis triangularibus late scariosis, ovario cum pedicello 1¼-pollicari viridi, perianthio 1½–2 poll. lato explanato, sepalis petalisque æquilongis carnosis incurvis concavis apicibus rotundatis flavis rubrolineatis, sepalis obovato-oblongis, petalis orbicularibus unguiculatis unguibus luteis, labello submembranaceo sepalis triente longiore unguiculato trilobo, ungue columnam amplectente, lobis lateralibus explanatis rotundatis grosse crenatis albis roseo suffusis, terminali late obcordato crenato lateribus deflexis albo roseo lineato, disco breviter costato, columna aurea apice auriculis 2 quadratis porrectis instructa, anthera depressa.

E. osmanthum, *Rodrig. Gen. et Sp. Orchid. Nov.* vol. ii. (1882) p. 134. *Rolfe in Orchid Rev.* vol. iv. (1896) p. 291. *Cogniaux in Martius Fl. Bras.* vol. iii. pars V. p. 64, t. xix. fig. 2.

E. Godseffianum, *Rolfe in Gard. Chron.* 1892, vol. i. p. 136. *L. Orchidoph.* 1892, p. 289. *Rolfe in Orchid Rev.* vol. ii. (1894) p. 323.

E. Capartianum, *L. Lind. in Lindenia*, vol. vii. p. 93, tab. 333; in *Journ. des Orch.* vol. vii. (1896) p. 209; *Orchid. Exot.* p. 758.

The Brazilian species of *Epidendrum* have quite lately been described in detail by Cogniaux, in a monograph of the *Orchideæ* of that country, now appearing as a volume of Martius's "Flora Brasiliensis." This admirably executed work will undoubtedly prove, when finished, the most valuable contribution to American Orchidology that has hitherto appeared, and it has the best wishes of all botanists for its completion. The Brazilian species of *Epidendrum* (of which there are one hundred and forty-one) are grouped under five sections, to one of the largest of which, *Encyclium*, *E. osmanthum* is referred. It is a native of forests in the provinces of Minas Geraes, and of Pernambuco, from which latter province it was introduced by Messrs. Sander & Co. in 1899, from whom the fine specimen here figured was purchased for the Royal

Gardens, Kew. It flowered in the Cattleya House in October, 1900; the flowers, which are odoriferous and aromatic, last about two months.

Descr.—*Pseudobulbs* obpyriform, two-leaved, three to five inches long, smooth. *Leaves* eight to ten inches long by one and a half inches broad, loriform, tip rounded, deeply channelled in the middle, coriaceous, sides convex, nerves obscure, costa beneath slender. *Peduncle* with sparingly branched panicle two feet long, slender, greenish speckled with red; branches spreading, few-flowered; pedicels with ovary an inch and a quarter long, spreading, green; bracts minute, triangular. *Flowers* one and a half to two inches broad. *Sepals* and *petals* widely spreading and incurved, concave, fleshy, yellow streaked with red; sepals linear-oblong; petals as long, orbicular, clawed. *Lip* one-third longer than the sepals, rather membranous, three-lobed, claw sheathing the column; side-lobes sub-orbicular, spreading, crenate, white suffused with rose; midlobe much larger, broadly obcordate, sides deflexed, white with crimson streaks, coarsely and irregularly crenate; disk shortly ribbed. *Column* two-auricled at the top, auricles quadrate, projecting forward.—*J. D. H.*

Fig. 1, front and side views of the column; 3, anther; 4, pollinia:—*all enlarged*; 5, *reduced* view of whole plant.

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M.S. del, J.N. Fitch lith.

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TAB. 7793.

IRIS TAURI.

Native of Asia Minor.

Nat. Ord. IRIDEÆ.—Tribe MORÆÆ.

Genus IRIS, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 686.)

IRIS (Juno) *Tauri*; bulbo ovoideo 3-floro, tunica extima pallide brunnea, radicibus crassis, foliis 6–7 per anthesin tubo floris multo brevioribus demum elongatis læte viridibus 3–5 poll. longis ad ½ poll. latis linearibus acuminatis apice obtusis marginibus scaberulis, spathæ valvis subherbaceis, flore 3 poll. expans., perianthii tubo 4-pollicari violaceo, limbi segmentis exterioribus 2-poll. longis obovato-spathulatis ultra medium reflexis lateribus erectis extus sordide viridibus intus saturate violaceis striis latis albis utrinque costæ ornatis, crista aurantiaca albo marginata, interioribus pollicaribus patenti-reflexis obovato-spathulatis undulatis violaceis, styli ramis segmenta perianthii superantibus oblongo-obovatis crispato-undulatis violaceis, filamentis liberis.

I. Tauri, *Siehe ex G. B. Mallet in Gard. Chron.* 1901, vol. i. p. 190, fig. 74, *et* p. 313.

According to a note in the *Gardener's Chronicle* (l.c. p. 313) by Mr. Siehe of "Hortus Orientalis," Mersina (near Tarsus), the discoverer of this beautiful little species, it is a native of alpine pastures in the Eastern Taurus, at six thousand five hundred feet elevation, and of the upper forests of *Juniperus excelsa* at four thousand five hundred feet, where it flowers, on the melting of the snow at the end of February and the beginning of March. As stated under *I. stenophylla*, Hausskn. (tab. 7734), Mr. Siehe was the discoverer of that plant also, and in the article cited he gives as its exact habitat (of which I had previously no information), "in undergrowths of *Pinus Laricio*, var. *Bruttia*, especially preferring dry, overgrown, hilly slopes of fine red loam." A third *Iris* of the same section discovered by Mr. Siehe, is *I. Bolleana*, Siehe, *Gard. Chron.* l.c. a hitherto undescribed species, except in so far as that the leaves are said to be narrow and curled, with white, membranous margins, and the flowers clear yellow. It inhabits limestone rocks near the sea at elevations of six hundred and fifty feet to nine hundred and fifty feet.

A plant of *I. Tauri* was received at the Royal Gardens,

Kew, in 1900, from Mr. Siehe, in a batch of bulbs of *I. stenophylla*. It flowered in a frame in January of the present year.

Descr.—*Bulb* ovoid, three-flowered; outer coat pale brown; roots very long, stout. *Leaves* six to seven, very short at flowering time, at length three to five inches long by half an inch broad, linear, narrowed to an obtuse tip, bright green. *Spathe-valves* sub-herbaceous. *Perianth-tube* four inches long, violet; segments obovate-spathulate, outer two inches long, reflexed from beyond the middle, sides erect, dark violet, with broad streaks of white; crest orange-yellow, bordered with white; inner segments an inch long, spreading and reflexed, undulate, violet. *Style-branches* longer than the perianth-segments, oblong-obovate, crisped and undulate, violet.—*J. D. H.*

Fig. 1 and 2, anthers; 3, portion of style-arm and stigma:—*all enlarged.*

1794

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d Imp

L. Reeve & Co. London.

Tab. 7794.

OXALIS DISPAR.

Native of British Guiana.

Nat. Ord. Geraniaceæ.—Tribe Oxalideæ.

Genus Oxalis, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 276.)

Oxalis (Thamnoxys) *dispar*; fruticulus cano-tomentellus, ramulis gracilibus teretibus, foliis longe petiolatis pinnatim 3-foliolatis, foliolis 2½–3 poll. longis lateralibus sessilibus oppositis terminali petiolulato ovato-lanceolatis acutis supra puberulis subtus molliter tomentellis basi cuneatis 6–10-nerviis nervis fere rectis, petiolis 3–4 poll. longis, petiolulo ⅔ poll. longo gracili, pedunculis axillaribus gracilibus pubescentibus apice breviter bifidis 5–10-floris, floribus subcapitatis brevissime pedicellatis foliolis parvis suffultis, sepalis erectis ⅓ poll. longis oblongo-lanceolatis obtusis eglandulosis puberulis, petalis ½-poll. longis obovato-rotundatis aureis marginibus basin versus coalitis et puberulis, filamentis basi connatis edentatis interioribus pilosis, ovario glabro stylis 5 brevibus glabris recurvis, stigmatibus capitellatis, capsula 5-cornuta, 15-costata costis 5 primariis puberulis.

O. dispar, *N.E. Br. in Kew Bulletin, ined.*

The genus *Oxalis*, of which upwards of four hundred and fifty species are known, is largely represented in Brazil and Guiana, from which countries more than one hundred species are described by Prognel in the second volume of Martius' "Flora Brasiliensis." Amongst the latter, the nearest (and very near) ally of *O. dispar* is *O. Laureolæ*, Progn., which has shorter petioles and leaflets, much smaller, more racemose flowers, and filiform, pilose styles. Another near ally is *O. Noronhæ*, Oliv. (in Hook. Ic. Pl. t. 1226), a native of Fernando de Noronha, a small group of oceanic islands which lie two hundred and ten miles N.-E. of Cape St. Roque, the easternmost point of Brazil. A description of this group, the largest island of which is a penal settlement, is to be found in the "Naturalists' Voyage" of Mr. Darwin, who was, I believe, the first man of science that ever landed on it, and make a collection of its plants. *O. Noronhæ* differs from *O. dispar* in its shorter, broader leaflets, small flowers, slender styles, and glabrous filaments.

O. dispar was obtained for the Royal Gardens, Kew, from Messrs. F. Sander & Co., of St. Albans. It flowered

freely all the year round in a stove. It is a native of Guiana.

Descr.—A small, softly-pubescent undershrub, about two feet high, woody at the base, with slender, spreading branches. *Leaves* alternate, long-petioled, trifoliolate. *Leaflets* two and a half to three inches long, ovate-lanceolate, acute, base cuneate; lateral opposite, sessile; terminal rather larger, petiolulate, all puberulous above, finely tomentose beneath; nerves six to ten pairs, nearly straight, prominent beneath. *Petiole* three to four inches long, very slender; petiolule two-thirds of an inch long. *Flowers* an inch across, golden-yellow, crowded at the bifid top of the peduncle, very shortly pedicelled, sub-tended by a few small leaflets; peduncle about as long as the petiole, and as slender. *Sepals* half an inch long, lanceolate, pubescent. *Petals* orbicular-obovate, connate above the base by their margins. *Inner filaments* pilose. *Styles* short; stigmas capitate.—*J. D. H.*

Fig. 1, calyx; 2, bases of three petals; 3, disk, stamens, and stigmas; 4, ovary:—*all enlarged.*

M.S. del. J.N.Fitch Lith.

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Tab. 7795.

IMPATIENS Thomsoni.

Native of the Himalaya Mountains.

Nat. Ord. Geraniaceæ.—Tribe Balsamineæ.

Genus Impatiens, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 277).

Impatiens *Thomsoni*; annua, glabra, caule simplici v. ramoso erecto superne tetragono angulis remote muriculatis, foliis alternis 3–5 poll. longis ovato-lanceolatis acuminatis cuspidato-serratis basi acutis supremis sessilibus inferioribus petiolatis, glandulis stipularibus magnis, pedunculis apicem versus caulis subcorymbosis strictis erectis paucifloris, floribus inter minores in racemos breves terminales dispositis roseis, bracteis $\frac{1}{10}$–$\frac{1}{4}$ poll. longis e basi angusta lanceolata linearibus acuminatis v. in cornu attenuatis apice glandulosis, pedicellis $\frac{1}{2}$–$\frac{3}{4}$ poll. longis fructiferis apice decurvis, sepalis 2 lateralibus $\frac{1}{8}$–$\frac{1}{5}$ poll. longis oblique ovatis falcatisve obtuse cuspidatis herbaceis, postico (labello) saccato v. late infundibulari in calcar incurvum abrupte attenuato, petalo antico (vexillo) orbiculari basi et apice retuso costa vix incrassata apice apiculato, petalis lateralibus (alis) bilobis lobo basilari oblongo rubro-punctato angulo superiore acuto terminali subæquilongo oblongo v. dolabriformi apice rotundato, auricula dorsali obscura, capsulis pollicaribus pendulis lineari-clavatis 5-gonis subacutis polyspermis, seminibus $\frac{1}{8}$–$\frac{1}{7}$ poll. longis oblongis lævibus fusco brunneis.

I. Thomsoni, *Hook. f. in Journ. Linn. Soc. Bot.* vol. iv. (1860) p. 128; *Fl. Brit. Ind.* vol. i. p. 469.

I. Thomsoni is one of the commonest sub-alpine species of the genus in the Western Himalaya, at elevations of eight thousand feet to twelve thousand feet, from Kumaon to the Indus River. It also occurs rarely in Sikkim, and no doubt inhabits the intermediate ranges of Nepal, though it has not hitherto been collected there. It is a very attractive plant, from the abundance of its rose-coloured flowers amongst the deep green foliage, followed by the red, drooping pods.

Seeds of *I. Thomsoni* were received at the Royal Gardens, Kew, from Mr. Duthie, in 1900, plants raised from which flowered in the Herbaceous Ground in August of the same year, and continued flowering till October.

Descr.—A perfectly glabrous, erect annual, eight to twelve inches high. *Stem* simple or sparingly branched, four-angled towards the top with muricate angles. *Leaves* alternate, crowded towards the top of the stem,

three to five inches long, ovate-lanceolate, acuminate, cuspidately serrate, base acute, dark green, upper sessile, lower petioled; stipular glands large, shortly stipitate, globose. *Peduncles* axillary, sub-corymbosely crowded at the top of the stem, stout, erect, naked, unequal in height, bearing terminal, short, few-flowered racemes; bracts narrowly lanceolate, very variable in length and breadth, one-tenth to one-fourth of an inch long; pedicels about twice as long. *Flowers* half to three-quarters of an inch long, pale rose-coloured. *Sepals* obliquely ovate, cuspidate, green. *Standard* erect, orbicular, notched at the base and apex. *Wings* twice as long as the standard; basal lobe acute, yellow, speckled with red, terminal dolabriform, deep rose-coloured. *Lip* rather longer than the wings, broadly funnel-shaped or saccate, suddenly narrowed into a slender, incurved spur. *Capsule* three-fourths of an inch long, narrowly sub-clavate, five-angled, pendulous from the decurved apex of the pedicel, many-seeded. *Seeds* about an eighth of an inch long, linear-oblong, smooth.—*J. D. H.*

Fig. 1, portion of top of stem with stipular glands; 2, portion of margin of leaf; 3, bract; 4, wing-petal; 5, stamens:—*all enlarged.*

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M.S.del, J.N.Fitch lith.

Vincent Brooks Day & Son Lith. Imp.

Tab. 7796.

ARCTOTIS Gumbletoni.

Native of Namaqualand.

Nat. Ord. Compositæ.—Tribe Arctotideæ.

Genus Arctotis, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 458.)

Arctotis (Euarctotis) *Gumbletoni*; tota capitulis exceptis tenuiter albo-lanata, caule brevi folioso, foliis 8–12-pollicaribus erectis petiolatis angustis pinnatifidis v. pinnatisectis lobis ad 1 poll. longis oblongis apice rotundatis integris terminali latiore crenato v. lobulato, pedunculo robusto nudo cavo, involucri hemispherici bracteis herbaceis rigidis extimis brevibus deltoideis in acumen setaceum pubescentem angustatis intermediis apice ala brevi scariosa rotundata terminatis intimis longe alatis, receptaculo lato plano setifero, fl. radii tubo brevi glabro, ligula pollicari saturate rubro-aurantiaca basin versus maculis linearibus distinctis v. confluentibus rubro-brunneis ornata, fl. disci tubo pilis paucis articulatis instructo, loborum apicibus incrassatis trigonis violaceis demum atris, achæniis (immaturis) radii discique extimis uno latere lanatis et basi pilis sericeis longe barbatis, pappi paleis 3-seriatis extimis, brevibus laceris, intimis oblongis hyalinis.

I have in vain endeavoured to identify this beautiful plant with any of the numerous species of *Arctotis*, whether described in published works, or preserved in the Herbarium of the Royal Gardens, Kew, but the descriptions are so imperfect, and the herbarium specimens, in many cases, so unsatisfactory, that it is not without hesitation that I describe it as new to science. About thirty species of the genus are described in Harvey & Sonder's "Flora Capensis," but as I find characters which have been overlooked by authors, I feel convinced that the whole genus needs a searching analysis. In the meantime I have the pleasure of naming this beautiful plant after my friend, W. Gumbleton, Esq., of Belgrove, Queenstown, Ireland, who raised and flowered it, and to whom horticulture in general and the *Botanical Magazine* in particular are indebted for procuring and liberally distributing many new, rare, and interesting plants.

There are two characters of the disk-flowers in *Arctotis* which deserve notice; one is the curious, almost purple-black, thickened, pendulous tips of the corolla-lobes; the other the irritability of the style, which protrudes the

stigmatic arms above the anthers for the purpose of fertilization by the pollen from other flowers, which being effected, the arms are withdrawn to their former position. This latter fact was, I believe, first made known by Lindley in a note under his description of *A. aureola* (Bot. Reg. t. 32). The singular, dark, finger-like marks at the bases of the ligules are not peculiar to the species here figured.

A. Gumbletoni is a native of Namaqualand, whence seeds of it were sent to Mr. Gumbleton by Mr. Ayres. It is a very free grower, and keeps flowering for months in a cool house.

Descr.—*Stem* very short, clothed, as are the leaves and peduncles, with a thin, white, densely-matted tomentum. *Leaves* basal, six to twelve inches long by one to one and a half broad, long-petioled, pinnatifid or pinnatisect; lobes oblong, tips rounded, quite entire or obscurely crenate, sinus rounded; lower lobes small, distant, and often decurrent; terminal broader, ovate lobed or lobulate. *Peduncle* eight inches to a foot high, stout, striate. *Head* three inches in diameter. *Involucre* hemispheric, two-thirds of an inch in diameter; outer bracts green, coriaceous, broadly ovate, cuspidate or tips setaceous, closely appressed, tips hairy; intermediate longer, acute or obtuse, herbaceous, with scarious tips and margins; inner twice as long, base green, terminating in a broad, scarious wing, rounded at the tip. *Ray-flowers* deep orange-red, tube very short; ligule with finger-like red-brown marks at the base. *Achenes* short, hairy; outer pappus scales short, lacerate, inner much longer, oblong.—*J. D. H.*

Fig. 1, outer bract of involucre; 2, ray-flower with part of ligule removed; 3, base of inner ray-flower with imperfect stamens; 4, disk-flower; 5, top of corolla-lobe of disk-flower; 6, stamens; 7, tip of style of disk-flowers with the style-arms appressed:—*all enlarged.*

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Tab. 7797.

EXORRHIZA Wendlandiana.

Native of the Fiji Islands.

Nat. Ord. Palmæ.—Tribe Arecæ.

Genus Exorrhiza (*Beccari in Ann. Jard. Buitenz.* vol. ii. (1885) p. 128.)

Exorrhiza *Wendlandiana*; trunco excelso erecto stricto annulato basi radicibus epigæis spinulosis sustentato, foliis breviuscule petiolatis lineari-oblongis 10–12 ped. longis patenti-recurvis pinnatisectis petiolo rhachique dorso rotundatis facie acute angulatis, segmentis 2-pedalibus æquidistantibus anguste lineari-lanceolatis costatis 8–10-nerviis, nervo marginali 0, spadice longe infra-foliaceo erecto breviter crasse pedunculato pedali ovato-oblongo stricto confertim ramoso, ramis 8–10 pollicaribus erecto-patulis strictis albis basi abrupte in globum pollicem diam. incrassatis, laxifloris fructiferis kermesinis, floribus bracteatis et 2-bracteolatis ternis 2 ♂, intermedio ♀, superioribus in ramis solitariis ♂, spathis 2 oblongis crasse coriaceis diu persistentibus, fl. ♂ symmetricis ovoideis, sepalis 3-gonis, petalis oblongis obtusis valvatis, staminibus 6, filamentis petalis brevioribus subulatis, antheris lineari-oblongis, pistillodio ovoideo apice trifido, fl. ♀ multo minoribus subglobosis, sepalis maris persistentibus, petalis orbicularibus imbricatis, ovario oblongo 1-loculari stigmate crasso ovoideo coronato, ovulo solitario parietali, fructu globoso ½ poll. diam. lævi, stigmate laterali, albumine æquabili.

E. Wendlandiana, *Beccari*, l.c.

Kentia exorhiza, *H. Wendl. in Bonpland.* vol. x. (1862) p. 191 (*excl. descr. fruct.*) *et in Seem. Fl. Vitiens.* p. 269, t. 78.

Areca ? *exorhiza, H. Wendl. in Bonpland* vol. ix. (1861) p. 260 (*nomen*).

Exorrhiza Wendlandiana is a native of the Fiji Islands, where it was discovered by Dr. Seemann, when accompanying Col. Smythe in his mission to that archipelago in 1860–1. It appears to be a very local Palm, its only known habitat being in humid forests, at a considerable elevation on the mountains of Somososo, in the islet of Taviuni. In his account of Col. Smythe's Mission, p. 370, Dr. Seemann mentions *Kentia ? exorrhiza* as being also a native of New Caledonia; but this is an error, the palm alluded to being probably *Cyphosperma Vieillardii*, Benth. & H.f.; so also with regard to Tonga, as another habitat, there is no evidence whatever of the palm alluded to being a Fiji one.

For living plants of *Exorrhiza Wendlandiana* the Royal Gardens, Kew, are indebted to the late Sir J. B. Thurston, K.C.M.G., who, when Governor of the Fijis in 1881, sent to Kew living plants in a Ward's case, one of which,

that here represented, flowered in the Palm House in February, 1901. Its height to the bases of the leaves is sixteen feet, to the top of the crown twenty-four.

Descr.—A noble palm, attaining, in its native country, sixty feet in height, with a straight annulate trunk, two to three feet in girth towards the base, where, above ground, it emits stout, spinous supporting roots. *Leaves* ten to twelve feet long, shortly petioled, linear-oblong, spreading and recurved, pinnatisect; leaflets very many, close-set equidistantly, two feet long by about two and a half inches broad, narrowed from the middle to the acuminate tip, costate, and eight to ten-nerved, bright green above, pale yellow-green beneath; petiole and rhachis sub-trigonous, with a flattened upper surface and rounded under. *Spadix* maturing several nodes below the lowest leaf, shortly peduncled, erect, ovoid; branches close-set, eight to ten inches long, slender, strict, erecto-patent, suddenly swollen above the base into a gibbus an inch in diameter, white, scarlet when fruiting. *Spathes* two, oblong, much shorter than the spadix. *Flowers* sessile, scattered in threes along the branches of the spadix, each three consisting of two males, about an eighth of an inch long, and an intermediate minute female; upper flowers on the branch solitary, male. *Bracts* and *bracteoles* minute. *Male fl.* symmetric, sepals minute, trigonous; petals oblong, obtuse, valvate; stamens 6; pistillode trifid. *Fem. fl.* ovoid; sepals of male; petals imbricate; ovary ovoid, one-celled, crowned by a sessile ovoid stigma; ovule solitary, parietal. *Fruit* globose, half an inch in diameter, stigma lateral.—*J. D. H.*

Fig. 1, portions of spathe and spadix with ♂ and ♀ flowers; 2, stamens; 3, pistillodium; 4, ♀ flower with calyx removed; 5, ovary; 6, vertical section of ovary; 7, fruiting branch of spadix; 8, fruit with remains of periauth; 9, vertical section of fruit; 10, embryo:—all except 7 *enlarged:* 11, reduced view of palm.

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Tab. 7798.

HABENARIA Lugardii.

Native of Bechuanaland.

Nat. Ord. Orchideæ.—Tribe Ophrydeæ.

Genus Habenaria, *Willd.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 624.)

Habenaria (Ate) *Lugardii*; foliis 2 radicalibus sub-oppositis terræ appressis sessilibus orbicularibus 6–8 poll. diam. carnosis fragilibus breviter acutatis multinerviis, scapo robusto vaginis paucis lanceolatis pollicaribus instructo, racemo 1–2 ped. longo 4–10 poll. diam. multi-laxifloro, bracteis $\frac{3}{4}$–$1\frac{1}{4}$ poll. longis lanceolatis, pedicellis $1\frac{1}{2}$–2 poll. longis arcuatis, floribus albis, sepalo dorsali $\frac{1}{2}$ poll. longo erecto ovato acuto concavo, lateralibus erecto-patentibus dorsali paullo longioribus ovato-lanceolatis acutis, petalis bipartitis segmento postico oblongo falcato erecto sepalo dorsali cohærente, antico fere filiformi pendulo pollicari, labello ad basin 3-partito segmentis filiformibus $1\frac{1}{2}$ poll. longis pendulis intermedio breviore, calcare 5–6 poll. longo, stigmatis processubus elongatis apicibus spathulatis porrectis viridibus, staminodiis minutis pyriformibus granulatis aureis, rostello prominulo acuto, antherarum tubulis brevibus, polliniis anguste oblongis caudiculis paullo brevioribus, glandula parva orbiculari.

H. Lugardii, *Rolfe in Dyer, Fl. Trop. Afric.* vol. vii. p. 228. *W. Wats. in Gard. Chron.* 1900, vol. ii. p. 322.

In habit and in the orbicular leaves appressed to the earth, this stately *Habenaria* resembles two Indian species, *H. platyphylla*, Spreng., and *H. plantaginea*, Lindl., from both of which it differs in the form of the petals, which are cleft to the base into very narrow segments, a character which refers it to the genus *Ate* of Lindley (reduced by all recent authors to *Habenaria*). It was discovered by Major Lugard, with *Crinum rhodanthum* (tab. 7777) and other bulbous plants in Botletle Valley, Ngamiland. Tubers of it were presented by that distinguished traveller to the Royal Gardens, Kew, in February, 1899, one of which flowered in the tropical Orchid House in October of the following year, and is here figured.

Descr.—*Leaves* two, radical, sessile, appressed to the ground, orbicular, four to six inches in diameter, fleshy, fragile, bright green, base amplexicaul, very many-nerved. *Scape* stout, with a few lanceolate acuminate sheaths. *Raceme* six to twelve inches long, very many-flowered, six inches in diameter; rhachis stout, acutely angled; bracts

about an inch long, lanceolate, acuminate, white or greenish. *Flowers* white, with green stylodes and yellow anther and staminodes ; pedicel with beaked ovary one and a half inch long, twisted, green. *Sepals* ovate, acute, dorsal erect, half an inch long ; lateral rather longer, sub-erect. *Petals* cleft to the base into two slender segments, one of which is erect and coheres to the dorsal sepal, the other is an inch long and pendulous. *Lip* cleft nearly to the base into three filiform pendulous segments an inch and a half long, and with two projecting spathulate green stylodes at its base ; spur five to six inches long, pendulous, very slender. *Anther-cells* linear, tubes short, upcurved ; pollinia linear-oblong, rather shorter than their caudicles. *Stylodes* (or stigmatic processes) very large, spathulate, green.—*J. D. H.*

Figs. 1 and 2, lateral and front views of column ; 3, pollinium :—*all enlarged.*

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Tab. 7799.

CINERARIA pentactina.

Native of South Africa?

Nat. Ord. Compositæ.—Tribe Senecionideæ.

Genus Cineraria, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 445.)

Cineraria (Eucineraria) *pentactina*; glaberrima, caule gracillimo scandente ramoso, ramis ramulisque pendulis pallide rubris, foliis parvis gracile petiolatis semi-orbiculatis ¾ poll. diam. breviter 5-lobis basi truncatis pallide viridibus, lobis late triangularibus 3-crenatis obtusis, paniculis elongatis ascendentibus laxifloris ramis ramulis distantibus pedunculisque gracillimis pallide rubris, pedicellis squamulis sparsis minutis subulatis instructis, involucri cylindracei ⅓ poll. longi ecalyculati bracteis 6–10 linearibus acuminatis v. lineari-oblongis acutis 3–5-nerviis marginibus late hyalinis, receptaculo parvo convexo, floribus radii 5, ligulis lineari-oblongis ½ poll. longis apice rotundatis aureis, floribus disci aurantiacis, acheniis radii minutis vix 1/12 poll. longis late oblongis compressis brunneis marginibus longe villosis, disco medio pubescente, pappo albo achænio vix duplo longiore, pilis margine cupulæ persistentis insertis mollibus scaberulis caducis.

The native country of *Cineraria pentactina* is unrecorded, though it may with little doubt be regarded as South Africa, from its close affinity with *C. lobata*, L'Herit. (Sert. Angl. t. 34) which has a wide range of distribution in the southern districts of Cape Colony. From that plant *C. pentactina* differs chiefly in its very slender climbing habit, less divided leaves, and lax paniculate inflorescence, with very long branches, peduncles, and pedicels. It is a very elegant plant, as seen climbing a pillar of the greenhouse in the Royal Gardens, Kew, of which it is a very old inhabitant, flowering profusely in the summer months.

Descr.—Quite glabrous. *Stem* very slender, about as thick as a sparrow's quill and branches dull red; branchlets pendulous. *Leaves* alternate, distant or fascicled on short lateral shoots, semi-orbicular in outline, three-fourths of an inch in diameter, shortly, broadly five-lobed, base truncate, pale green on both surfaces; petiole slender, about as long as the blade, base not auricled. *Flowers* in lax, ascending, terminal panicles; peduncles and pedicels very slender, pale red; bracts on the pedicels minute,

distant, subulate, green. *Involucre* cylindric, about a third of an inch long, ecalyculate; bracts six to ten, linear, acute, or acuminate, three- to five-nerved, green, with scarious margins. *Ray-flowers* five, golden-yellow; ligule half an inch long, linear-oblong, tip minutely three-toothed. *Disk-flowers* orange-yellow. *Achenes* minute, broadly oblong, compressed, red-brown, margins densely villous, disc pubescent in the middle. *Pappus-hairs* inserted in the mouth of persistent cup, rather longer than the achene, white, scaberulous, caducous.—*J. D. H.*

Fig. 1, ray- and 2, disk-flowers; 3, hair of pappus; 4, stamens; 5, stigmas of ray-flower; 6, achene with pappus:—*all enlarged.*

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TAB. 7800.

CALORHABDOS CAULOPTERA.

Native of China.

Nat. Ord. SCROPHULARINEÆ.—Tribe DIGITALEÆ.

Genus CALORHABDOS, *Benth.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 963 (*ex parte.*)

CALORHABDOS *cauloptera*: herba erecta, fauce corollæ excepta glaberrima, caule gracili subsimplici anguste tetraptero, foliis alternis breviter petiolatis ovato-lanceolatis acuminatis argute serrulatis basi acutis, racemo spiciforme terminali erecto 6–8 poll. longa multi-densifloro, rhachi tetragona, floribus brevissime pedicellatis unibracteatis bractea ovato-lanceolata calyce subæquilonga, calycis $\frac{1}{8}$ poll. longi segmentis lanceolatis erecto-patulis, corolla deflexa $\frac{1}{3}$ poll. lata ad medium 5-loba rubro-purpurea, fauce annulo lato villoso aucto, lobo postico late ovato depresso apice bidenticulato, ceteris minoribus ovatis acuminatis patulis, staminibus 2 erectis, antheris didymis aureis, capsula calyci æquilonga ovoidea bisulcata polysperma loculicida, valvis bipartitis, seminibus ovoideis.

C. cauloptera, *Hance in Trimen Journ. Bot.* vol. xv. (1877) p. 298. *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxvi. (1890) p. 195; *in Hook. Ic. Pl.* vol. xxvii. sub t. 2669.

The genus *Calorhabdos* was founded by Bentham on a Nepalese plant closely allied to *Veronica*, *C. Brunoniana* (see Hook. Ic. Plant. t. 2669), to which was subsequently added a Chinese and Japanese, *C. axillaris*. Of these the latter has been regarded as the type of a distinct genus (*Botryopleuron*) by Mr. Hemsley, differing from *C. Brunoniana* in habit and in its axillary spikes. Three additional species of *Botryopetalum*, all Chinese, have since been discovered, confirming the validity of the genus (see Hemsley, l.c. t. 2670); and the Nepalese *C. Brunoniana* has been found by the Abbé Delavay in the province of Yunnan, in China, though in no intermediate locality, and a second species of *Calorhabdos*, the subject of this plate, has been added to it.

C. cauloptera is a native of the provinces of Ichang and Kwangtung. Seeds of it were sent to the Royal Gardens, Kew, in 1896, by Dr. Henry, plants raised from which flowered in a greenhouse in August, 1900. It is remarkable for its four-winged stem and four-angled rachis of the spike; those organs in *C. Brunoniana*, and in all the species of *Botryopleuron* being perfectly terete.

OCTOBER 1ST, 1901.

Descr.—A slender, erect herb, everywhere glabrous, except on the throat of the corolla. *Stem* unbranched, narrowly four-winged. *Leaves* very shortly petioled, alternate, three to five inches long, ovate-lanceolate, acuminate, acutely serrulate, with the serratures inflexed, base acute, deep green above, beneath pale, with prominent nerves. *Inflorescence* terminal, shortly peduncled, spiciform raceme from six to eight inches long, very slender, half an inch broad, densely many-flowered; bracts lanceolate, about as long as the calyx, green. *Flowers* very shortly pedicelled. *Calyx* about an eighth of an inch long, divided nearly to the truncate base into five sub-equal, lanceolate, acuminate lobes. *Corolla* deflexed, tube short, limb about one-third of an inch broad, five-lobed to the middle, dark red-purple; posticous lobe largest, depressed, broadly ovate, tip two-toothed; lateral lobes spreading, ovate, acuminate; mouth with a broad ring of purple matted hairs. *Stamens* 2, exserted; anthers oblong, didymous, yellow. *Ovary* compressed, two-celled; style shorter than the filaments, erect; stigma minute.—*J. D. H.*

Fig. 1, portion of margin of leaf; 2, flower; 3, calyx and bract; 4, corolla laid open and stamens; 5, ovary:—*all enlarged.*

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TAB. 7801.

RUBUS PALMATUS.

Native of Japan and China.

Nat. Ord. ROSACEÆ.—Tribe RUBEÆ.

Genus RUBUS, *Linn*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 616.)

RUBUS *palmatus*; frutex fere glaberrimus, ramosus eglandulosus, ramis elongatis gracilibus scandentibus, aculeis sparsis rectis, foliis in ramulos abbreviatos fasciculatis supremis solitariis longe graciliter petiolatis ambitu orbicularibus et palmatim 5-fidis vel late ovatis pinnatifido-5–7-lobis subcaudato-acuminatis læte viridibus lobis segmentisve ovatis v. lanceolatis acuminatis inciso-serratis subtus pallidis, petiolo 1–2 poll. longo distante setoso v. aculeolato, stipulis supra-basilaribus lineari-lanceolatis obscure denticulatis, floribus axillaribus solitariis, pedicellis gracilibus sparse setulosis, calycis glabri v. pilosuli tubo hemisphærico lobis lanceolatis acuminatis parce serratis intus glabris, petalis patentibus sepalis vix duplo longioribus ellipticis obtusis albis, antheris aureis, carpellis summo toro cylindraceo confertis glaberrimis, stylis elongatis filiformibus erectis stigmate capitellato, fructu globoso flavo sapido.

R. palmatus, *Thunb. Fl. Jap.* p. 217; *Ic. Pl. Jap. Dec.* iv. tab. 6. *Sieb. & Zucc. Fl. Jap. Fam. Nat.* facc. i. p. 18. *Miq. Ann. Mus. Bot. Lugd. Bat.* vol. iii. p. 35; *A. Gray, Bot. Japan*, p. 387, *pro parte*. *Maxim. in Bull. Imp. Acad. Sc. Petersb.* vol. xvii. (1872) p. 154; (*Mel. Biol.* viii. p. 384). *Franch. & Sav. Enum. Pl. Jap.* vol. i. p. 126. *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxiii. (1886–8) p. 234.

R. coptophyllus, *A. Gray, Bot. Perry Exped. Japan*, p. 311.

Rubus palmatus is a very elegant species, differing from the typical forms of the genus in the elliptic shape of its white spreading petals. It has several allies in Japan and China with similar flowers, especially *R. incisus*, Thunb., which differs in its leaves being only 3-lobed, and in the tomentose inner surface of the calyx-lobes. Thunberg's figure of *palmatus* is excellent; De Candolle has doubtfully referred it to *R. microphyllus*, Linn. f., also a native of Japan, which has recurved prickles, and a villous calyx.

The plant of *R. palmatus*, from which the accompanying figure was made, was obtained from Messrs. Veitch & Sons, of Chelsea, in 1899. It is now twenty feet high, trained against a pillar in the Himalaya wing of the Temperate House of the Royal Gardens, Kew, where it flowered in April of this year. There are specimens of it in the Kew Herbarium from Yokohama, Nagasaki, and the central mountains of Japan, ascending to seven thousand

feet; also from Corea, and from Chekiang in China. It has so far proved hardy in my garden near Sunningdale, as to have survived without injury the winter of 1900–1.

Descr.—A glabrous, much branched, eglandular shrub, with slender, climbing branches. *Prickles* scattered, straight, compressed. *Leaves* one to three inches long, orbicular and palmately five or six-lobed, or broadly ovate and sub-pinnatifidly lobed, base sub-cordate, lobes ovate or lanceolate, acuminate, inciso-serrate, bright green above, pale beneath; petiole one to two inches long, bearing a few scattered minute bristles; stipules inserted above the base of the petiole, linear, acuminate, sparingly denticulate. *Flowers* solitary, axillary, one to one and a half inches in diameter; pedicels very slender, sparsely setose. *Calyx-tube* hemispheric; lobes linear-lanceolate, about half as long as the petals, acuminate, sparingly serrate. *Petals* elliptic, obtuse, pure white. *Filaments* slender, erect, anthers yellow. *Carpels* crowded on the top of a short, cylindric column, oblong, smooth; style very slender. *Fruit* globose, nearly an inch in diameter, yellow, succulent.—*J. D. H.*

Fig. 1, base of petiole and stipules; 2, base of calyx, stamens, and carpels; 3, carpel:—*all enlarged.*

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„ 7799.—CINERARIA PENTACTINA.
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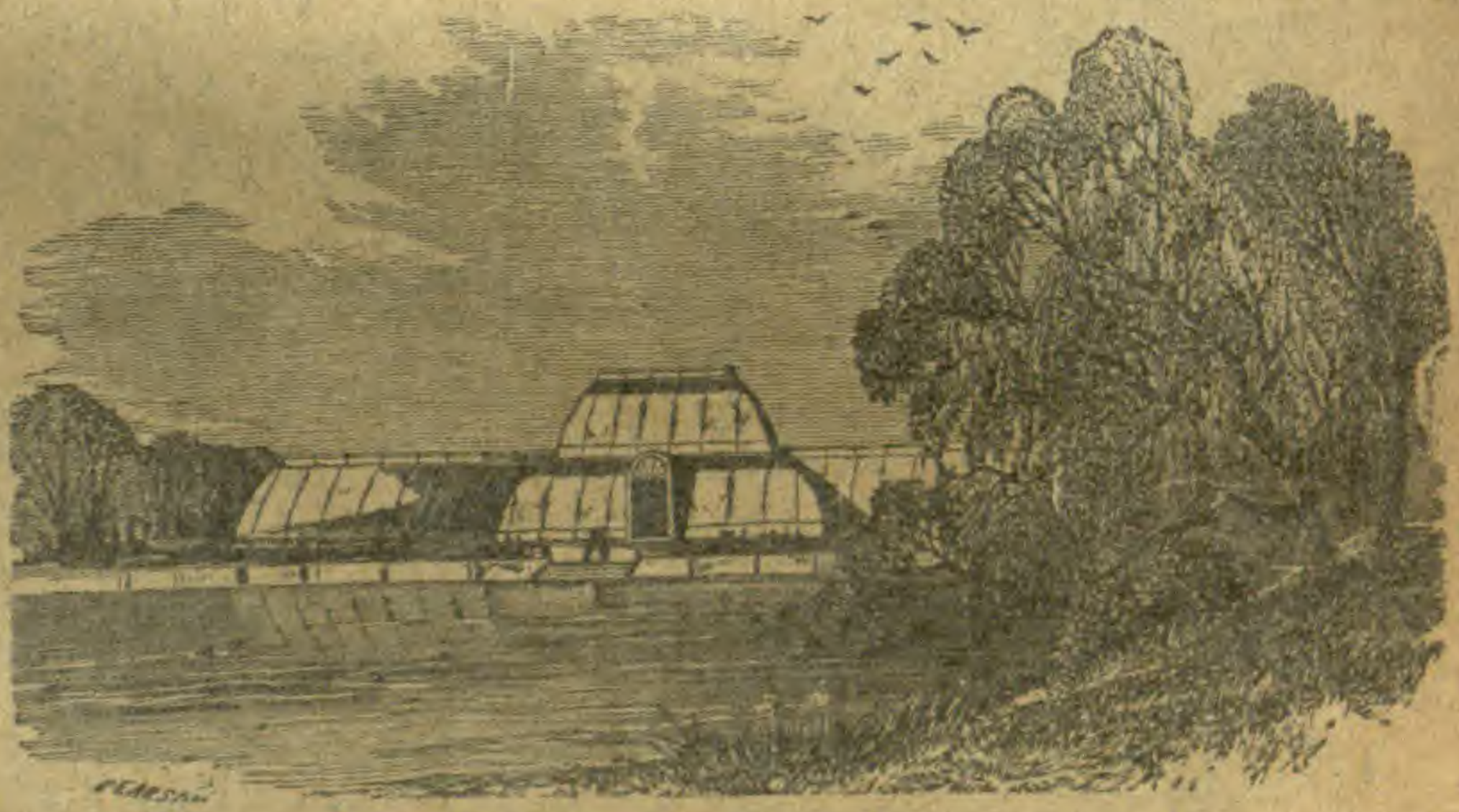

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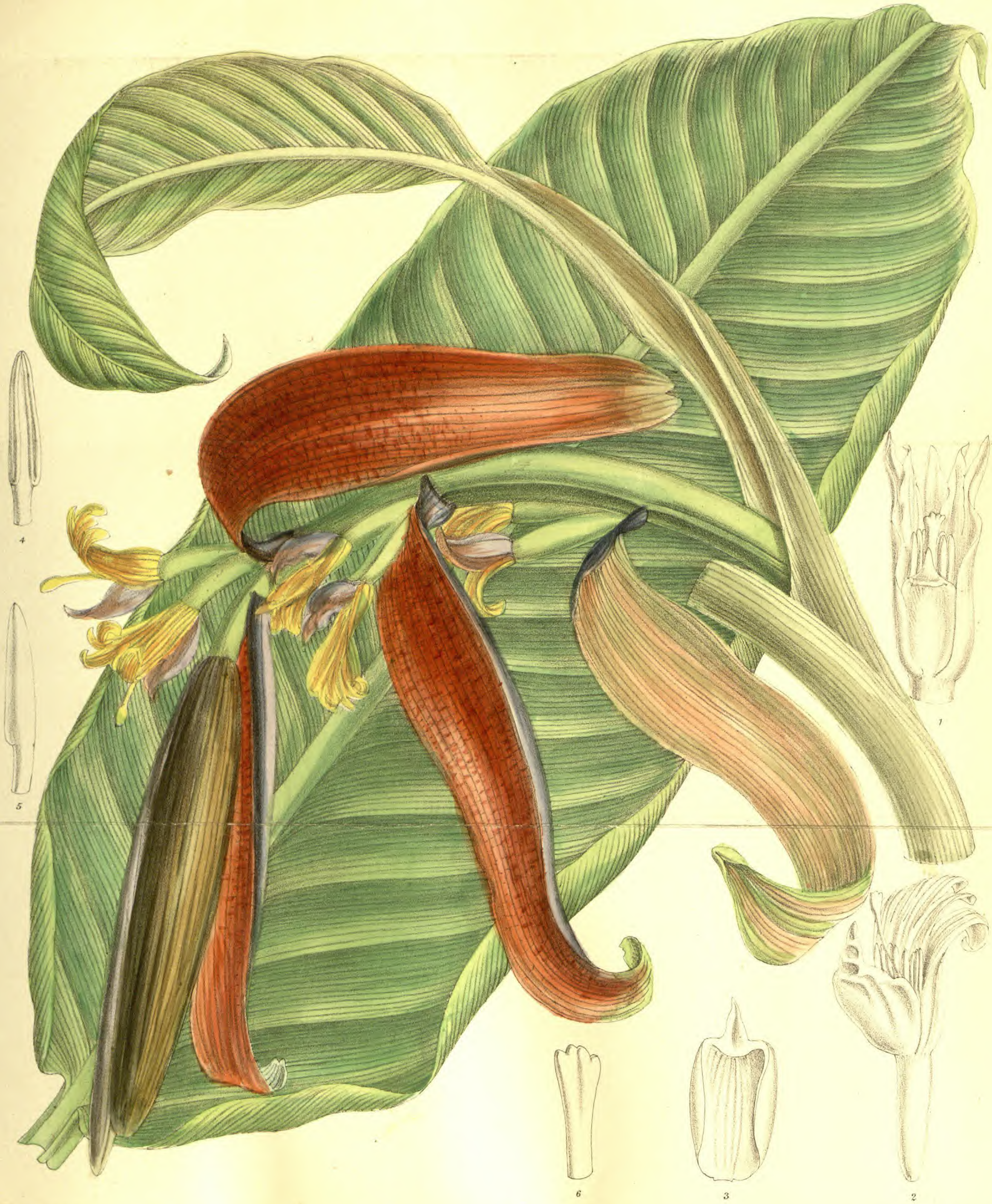

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Tab. 7802.

MUSA oleracea.

Native of New Caledonia.

Nat. Ord. Scitamineæ.—Tribe Museæ.

Genus Musa, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 655.)

Musa (Eumusa) *oleracea*; tubere subterraneo magno napiformi pluricauli, caudice mediocri viridi-violaceo glaucescente, foliis petiolatis 1–2-pedalibus oblongis acuminatis basi rotundatis supra saturate viridibus subtus pallidis glaucescentibus, nervis primariis distinctis subremotis impressis, arcuatis petiolo pedali crasso, spica cernua ad 8 poll. longa breviter et crasse pedunculata, pedunculo rhachique viridi, bracteis paucifloris inferioribus 6 poll. longis linearibus v. lineari-oblongis obtusis recurvis extus fusco-purpureis glaucis intus flavo-rubris clathratim rubro striatis apice viridibus, ovario teretiusculo viridi, perianthio 1 poll. longo, calycis flavidi fusco picti nervosi lobis 2 exterioribus oblongis obtusis dorso infra apicem calcaratis, interiorum lobis lateralibus dorso infra apicem calcaratis intermedio latiore ecalcarato, corolla calyce triente breviore quadrata pallide purpurea margine superiore medio ligula instructa v. abrupte acuminata, stigmate clavato apice lobulato.

M. oleracea, *Vieill. in Ann. Sc. Nat.* Sér. IV. vol. xvi. (1861) p. 46.

M. sapientum, *Linn.* var. oleracea, *Baker in Kew Bulletin*, 1894, p. 250.

Poïéte *incol.*

Musa oleracea is a very interesting species, being, as far as is known, unique in the genus in having a very large underground tuber, replete with starch, which is boiled, toasted, or baked as an article of food by the natives of New Caledonia, its flavour, according to M. Vieillard, resembles that of the yam. The tuber has "eyes" like a potato, and the plant may hence be propagated by division.

From *M. paradisiaca*, *M. oleracea* is easily distinguished by the tuber, the short leaves glaucous beneath, with very well defined arching primary nerves, about three-quarters of an inch apart, and impressed on the upper surface; the short spike with very few-flowered, long, narrow bracts, which are glaucous purple externally, and red within, the much shorter calyx, which is dull yellow stained with pale brown or purple, and the colour of the corolla. It is said by M. Vieillard never to flower in New Caledonia, where it perhaps is known only as a cultivated plant. It did not ripen fruit at Kew.

November 1st, 1901.

M. oleracea was received at the Royal Gardens, Kew, from Mr. W. Souter, Superintendent of the Gardens of the Brisbane Acclimatization Society. It flowered in the Mexican wing of the Temperate House in August, 1900, but did not ripen fruit.

Descr.—*Stem* four to seven feet high, rising from a large underground turnip-shaped corm, green and violet, glaucous. *Leaves* one to two feet long, rather shortly stoutly petioled, oblong, acuminate, base rounded, dark green above, pale and glaucous beneath; lateral nerves very distant, about three-quarters of an inch apart, arching. *Spike* decurved, shortly peduncled; rhachis stout, dark green. *Bracts* few-flowered, lower remote, six inches long, linear or ligulate, dull purple, and very glaucous, externally bright pale red within, somewhat tessellately mottled with darker red, tips obtuse, green. *Calyx* about an inch long; segments strongly nerved, dull yellow, suffused with pale, dirty purple or brown. *Corolla* about one-third shorter than the calyx, quadrate, abruptly cuspidate, or with the cusp sometimes produced into ligule, pale dull purple.—*J. D. H.*

Fig. 1, bud; 2, flower; 3, corolla; 4 and 5, stamens; 6, top of style and stigma:—*all enlarged.*

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Tab. 7803.

SENECIO magnificus.

Native of Australia.

Nat. Ord. Compositæ.—Tribe Senecionideæ.

Genus Senecio, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 446).

Senecio (Radiati) *magnificus*; suffrutex glaberrimus, glaucus, caule erecto robusto ramisque teretibus foliosis, foliis grosse subremote dentatis acutis ad ½-pedalibus obovato-oblongis oblanceolatisve basi angustatis, superioribus minoribus lanceolatis semi-amplexicaulibus, costa subtus prominula, nervis obscuris, capitulis longe pedunculatis in corymbos laxos aphyllos dispositis, pedunculis bracteis subulatis auctis, involucri ½ poll. longi cylindracei basi obscure calyculati bracteis linearibus obtusis herbaceis, receptaculo plano lævi, fl. radii 8–12 ligulis ⅔ poll. longis linearioblongis apice obtusis obscure crenatis aureis, styli ramis fuscis, fl. disci numerosis involucro paullo longioribus aureis, achæniis puberulis, pappi albi setis scaberulis.

S. magnificus, *F. Muell. in Linnæa*, vol. xxv. (1852) p. 418; *Key Syst. Vict. Pl.* vol. i. p. 340. *Sonder in Linnæa*, l.c. p. 526. *Benth. Fl. Austral.* vol. iii. p. 665.

Though hardly meriting the grandiose specific name given to this plant by the late Baron Mueller, it is a very conspicuous member of the enormous genus of groundsels, and in this respect heads the list of the twenty-eight Australian species. It is a mountain plant, native of the Grampians in Victoria, and of the Flinder's Range in South Australia. Seeds of it were received at the Royal Gardens, Kew, in 1899, from Mr. Maiden, F.L.S., Director of the Botanic Gardens of Sidney, from which plants were raised which flowered in the Temperate House in October, 1900.

Descr.—A tall, stout, quite glabrous, glaucous, erect, sparingly branched under-shrub, stem and branches terete, leafy. *Leaves* rather coriaceous, coarsely sub-crenately toothed, lower about six inches long, oblong-lanceolate or oblanceolate, narrowed at the base; upper smaller, lanceolate, semi-amplexicaul, costa thickened beneath, nerves obscure. *Heads* in loose, peduncled, leafless corymbs; pedicels slender, bearing scattered subulate bracts. *Involucre* half an inch long, cylindric, green, base obscurely calyculate; involucral bracts linear, obtuse, herbaceous,

green. *Receptacle* flat, smooth. *Ray-flowers* eight to twelve, ligules two-thirds of an inch long, linear-oblong, golden-yellow, tips obscurely crenate; style-arms pale brown. *Disk-flowers* very many, rather longer than the involucre, five-toothed. *Achenes* short, smooth, puberulous. —*J. D. H.*

Fig. 1, ray-flower with portion of ligule removed; 2, disk-flower; 3, hair of pappus; 4, anthers; 5, arms of style:—*all enlarged.*

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Tab. 7804.

LIPARIS tricallosa.

Native of the Malay Peninsula and Sulu Archipelago.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Liparis, *Rich.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 495.)

Liparis (Mollifolia) *tricallosa*; caule brevi vix pseudobulboso, foliis 3–5 sessilibus 4–8 poll. longis ellipticis v. oblongo-lanceolatis acuminatis 5–7-nerviis membranaceis pallide viridibus marginibus undulatis nervisque subtus rubris, pedunculo rhachique racemi elongati laxe-multiflori angulatis rubris, bracteis parvis ovato-lanceolatis, pedicellis cum ovario 1–1½ poll. longis rubris, sepalis pollicaribus loriformibus obtusis citrinis lateralibus infra labellum positis, petalis sepalis paullo brevioribus recurvis, ob margines revolutos filiformibus rubris, labelli breviter unguiculati lamina suborbiculari subacuta plana deflexa ¾ poll. lata aurea lineis saturate rubris creberrime picta, ungue tricalloso, callis lateralibus reniformibus intermedio minuto globoso, columna minuta incurva marginibus supra medium dilatatis, capsula ellipsoidea.

L. tricallosa, *Rchb. f. in Gard. Chron.* 1879, vol. i. pp. 225, 684 *et* 1901, fig. 85. *Ridley in Journ. Linn. Soc. Bot.* vol. xxii. (1886) p. 275.

L. venosa, *Ridley* l.c. vol. xxiv. (1888) p. 350, *et* vol. xxxii. (1896) p. 224.

A very well-marked *Liparis*, discovered by Mr. Burbidge, F.L.S., Curator of the Trinity College Botanic Gardens (author of "The Gardens of the Sun"), in the Sulu Archipelago; and more recently found in the Malay Peninsula, at Perak, Johore, and Singapore. The sepals vary in colour, being lemon-yellow in the specimen here figured. The petals and striations of the lip are lake red, rather than carmine as described by Mr. Ridley in his *L. venosa*, which is unquestionably conspecific.

L. tricallosa was introduced into cultivation by Mr. Bull, who in 1879 flowered a plant of it received from its discoverer, which was described by Reichenbach as cited above. The specimen here figured was presented to the Royal Gardens, Kew, by the Right Honourable Joseph Chamberlain, Secretary of State for the Colonies, in full flower, in June, 1900.

Descr.—*Stem* short, stout, hardly pseudobulbous. *Leaves* three to five, sessile, four to eight inches long, elliptic- or oblong-lanceolate, acuminate, five to seven-nerved, membranous, margins waved, and nerves beneath red. *Raceme*

peduncled, six to eight inches long, loosely many-flowered, rhachis acutely angled, red; bracts small, lanceolate; pedicel and ovary together one to one and a half inches long, slender, twisted, red. *Sepals* an inch long, strap-shaped, obtuse, lemon-yellow, two lateral placed under the lip. *Petals* rather shorter than the sepals, arched, re-curved, filiform, red. *Lip* deflexed, sub-orbicular, flat, three-fourths of an inch broad, golden-yellow, closely striped with red, claw very short, with two lateral reniform calli, and a minute, globose, intermediate one.—*J. D. H.*

Fig. 1, claw of lip; 2, side, and 3, front view of column and anther; 4, anther; 5, pollinia:—*all enlarged.*

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Tab. 7805.

TREVORIA Chloris.

Native of the Andes of Colombia.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Trevoria, (*F. C. Lehm. in Gard. Chron.* 1897, vol. i. p. 345.)

Trevoria *Chloris*; pseudobulbis fasciculatis cylindraceis v. elongato-pyriformibus ecostatis 1-foliatis infra medium vaginis lanceolatis brunneis rigidis obtectis, folio subsessili oblongo-lanceolato plicato, pedunculo e basi pseudobulbi robusto decurvo flexuoso vaginis pollicaribus lanceolatis brunneis striatis ornato, spica pendula pauciflora rhachi robusta, bracteis triangularibus brevibus cucullatis cuspidatis, floribus ad 2½ poll. latis viridibus, ovario brevi, perianthio subcampanulato, sepalis columnæ basi oblique insertis late ovatis subacutis concavis carnosulis, petalis sepalis multo angustioribus oblongo-lanceolatis patenti-recurvis pallidis, labello carnoso basi columnæ adnato sepalis breviore 3-lobo, lobis lateralibus auriculiformibus erectis disco processu linguæformi columnæ supposito revoluto aucto, terminali stipitato ovato medio 5-sulcato, stipite tumido obtuso callo bilobo instructo non articulato, columna brevi crassa clinandrio terminali, anthera parva hemisphærica 1-loculari, polliniis pyriformibus apicem versus caudiculæ elongatæ affixis, glandula orbiculari demum longe extrusa, stigmatis fovea transversa.

Trevoria Chloris, *F. C. Lehm. in Gard. Chron.* 1897, vol. i. p. 345, fig. 128. *Rolfe in Orchid. Rev.* vol. viii. (1900) p. 335.

The very remarkable Orchid here figured was discovered by Mr. F. C. Lehmann in moist woods at four thousand eight hundred feet to five thousand five hundred feet elevation on the western slope of the Andes of Colombia, near Popayan, flowering in September and November. Its nearest but not very close ally is, according to Mr. Rolfe, *Coryanthes*, from which it differs conspicuously in the structure of the lip. The name *Trevoria* recalls the great services rendered to horticulture, and especially to a knowledge of Orchids, by Sir Trevor Lawrence, Bart., M.P., President of the Royal Horticultural Society of London, to whom I am indebted for communicating the specimen from which the accompanying figure was made.

Descr.—*Pseudobulbs* tufted, three inches long, cylindric, one half to one inch in diameter, smooth, green, one-leaved; sheaths brown, rather rigid, striate. *Leaf* oblong-lanceolate, acuminate, plicate, seven-nerved, narrowed into a very short petiole, bright green above, yellowish-green

beneath, with strong nerves. *Peduncle* from the base of the pseudobulb, four to five inches long, decurved, very stout, flexuous, green, with brown-streaked sheaths, of which the lower are short, appressed, the upper nearly an inch long, loose, lanceolate. *Spike* pendulous, few-fld.; rhachis stout, flexuous, green; bracts like the upper sheaths of the peduncle. *Ovary* short, curved, green. *Perianth* sub-campanulate, about two and a half inches broad, base rounded. *Sepals* inserted in the base of the column, broadly ovate, obtuse, concave, fleshy, green. *Petals* as long as the sepals, but much narrower, oblong-lanceolate, obtuse, spreading and recurved, pale yellow-green. *Lip* adnate to the base of the column, rather shorter than the sepals, very thick, fleshy, nearly white, three-lobed; lateral lobes short, ear-shaped, erect, with a revolute tongue-shaped process at the base; terminal lobe ovate, shortly stipitate, with a two-lobed callus on the stipes; disk five-grooved. *Column* very short, broad and thick, green. *Anthers* hemispheric, with an upcurved beak; pollinia pyriform, on a long inflexed strap; gland orbicular.—*J. D. H.*

Fig. 1, upper part of ovary, lip, and column; 2, side view of column; 3, hypochile with stipes of epichile; 4 and 5, pollinia:—*all enlarged.*

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TAB. 7807.

CYRTOPODIUM PALMIFRONS.

Native of Brazil.

Nat. Ord. ORCHIDEÆ.—Tribe VANDEÆ.

Genus CYRTOPODIUM, *Br.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 541).

CYRTOPODIUM *palmifrons*; caulibus 2-pedalibus fasciculatis suberectis compressis infra medium vaginis citrinis purpureo marginatis imbricatis arcte adpressis velatis dein foliatis (folium pinnatum referentibus) foliis 6–8 poll. longis distichis lineari-lanceolatis acuminatis 3-nerviis basi angustatis laete viridibus subtus pallidis, vaginis caulinis consimilibus, pedunculis basilaribus caulibus brevioribus adscendentibus vaginis distichis oblongis acutis coloratis imbricatis laxe tectis, panicula ampla 15 poll. longa 10 lata oblonga nutante multiflora, rachi ramisque gracilibus viridibus, bracteis axillaribus floralibusque oblongis v. ellipticis albis roseo marginatis caducis his $\frac{1}{3}$–$\frac{1}{2}$ illis $\frac{3}{4}$–1 poll. longis, floribus ad 1 poll. latis breviter pedicellatis, sepalis suborbiculatis apice rotundatis labelloque citrinis roseo maculatis, petalis paullo latioribus citrinis, labello sepalis breviore geniculatim unguiculato subæqualiter 3-lobo, lobis lateralibus erectis reniformi-rotundatis, terminale 2-lobulato lobulis margines versus discoque basi callis globosis confertis instructo, columna parva, anthera antice appendiculata, polliniis oblongis caudicula lata sessilibus.

C. palmifrons, *Reichb. f. et Warm. in Ot. Bot. Hamb.* fasc. ii. p. 88. *Warm. in Vidensk. Med. Nat Foren. Kjobenh.* 1884-7, p. 87, t. 6, f. 3; *Symb. ad Fl. Bras. Centr.* vol. xxx. p. 850, t. 6, f. 3.

This very remarkable Orchid was discovered growing on trees in the forests of Lagoa Santa, in Central Brazil, by the Danish traveller and botanist, J. E. B. Warming. For the beautiful specimen here figured, which flowered in a tropical house in April, 1901, the Royal Gardens are indebted to Dr. E. A. Heath, of Eaton Square. The specific name *palmifrons* is in allusion to the resemblance which the leafing stem bears to the leaf of an Arecoid Palm, the leafless part of the stem answering to the petiole, and the distichous narrow leaves to the pinnules of the palm.

Descr.—*Stems* tufted, ascending, about two feet high, straight or curved, compressed, closely invested by the short, uniform sheaths of fallen leaves, each sheath is about half an inch long, lemon-coloured, with purple margins, the latter giving the effect of a zigzag purple

line running up the stems. *Leaves* six to eight inches long, distichous; blade sessile on the sheath, linear-lanceolate, acuminate, narrowed at the base, bright green. *Peduncle* basal, stout, ascending, branching into a spreading, inclined, many-flowered panicle fifteen inches long by ten inches broad. *Bracts*, axillary and floral elliptic or oblong, membranous, caducous, white with rose-coloured margins, floral one-third of an inch to half an inch long, axillary much larger. *Flowers* about an inch broad, shortly pedicelled. *Sepals* sub-orbicular, lemon-coloured, spotted with rose-pink. *Petals* rather broader, lemon-coloured. *Lip* colour of the sepals, geniculately clawed, three-lobed; lobes sub-equal, lateral erect, broadly reniform, terminal broadly bilobulate; disk and margins covered with globose calli. *Column* very short.—*J. D. H.*

Fig. 1, portion of panicle of *nat. size*; 2, side view, and 3, front view of column and lip; 4, anther; 5, pollinia:—*all enlarged*; 6, reduced view of whole plant.

TAB. 7806.

SYRINGA OBLATA.

Native of North China.

Nat. Ord. OLEACEÆ.—Tribe SYRINGEÆ.

Genus SYRINGA, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. ii. p. 675.)

SYRINGA (Eusyringa) *oblata*; frutex fere glaberrimus, 8–10-pedalis, foliis subhysteranthiis 2–3½ poll. latis subcoriaceis rhombeo-ovatis orbicularibusve acutis v. subcuspidatis basi rotundatis v. late cordatis supra læte viridibus marginibus sæpe roseo tinctis subtus pallidioribus demum rufescentibus, petiolo ½–1 poll. longo, thyrso breviter pedunculato globoso v. oblongo dense-multifloro, ramis ramulis calycibusque puberulis, floribus breviter pedicellatis pallide lilacinis, calyce $\frac{1}{10}$ poll. longo ad medium inæqualiter 4-fido, lobis ovatis v. ovato-lanceolatis acutis, corollæ tubo ½ poll. longo nudo v. subglanduloso, limbi ⅔ poll. lati lobis orbiculatis v. late ellipticis planis v. subconcavis.

S. oblata, *Lindl. in Gard. Chron.* 1859, p. 868. *Fortune*, l.c. 1860, p. 170. *Naud. in Fl. des Serres*, vol. xiii. (1858, in 1860 public.) p. 126 (*sub Æsculo indica*) *Dippel, Handb. Laubholz.* vol. i. p. 113. *Sargent, Gard. & For.* vol. i. (1888) p. 221, fig. 39. *Decne in Nouv. Arch. Mus. Paris.* Sér. II. vol. ii. p. 40. *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxvi. (1889) p. 83. *Franch. Pl. David.* p. 205.

S. chinensis, *Bunge in Mém. Sav. Etr. Pétersb.* vol. ii. (1835) p. 116 (*non Willd.*).

Syringa oblata is so closely allied to *S. vulgaris*, t. 183, that Prof. Sargent (Gard. & Forest, l.c.) who has given a good *resumé* of the characters of the Chinese species of the genus, says that it is, perhaps, a geographical variety of that plant. He points out as differences, its thicker leaves, its flowering twelve days later, and the leaves turning a dark russet-red in autumn. Before, however, accepting this view, it is necessary to compare the fruits and seeds of the two plants, of which those of *S. oblata* are as yet unknown to me.

Fortune was the introducer of *S. oblata* into Europe. He found it in a garden at Shanghai. Some years later the Abbé David procured specimens from a garden in Peking; and more recently it has been collected in a wild state in Western Kansu by Potanin, and at Moukden, in Shingking, by the Rev. J. Webster. A plant of it was obtained by the Royal Gardens, Kew, in 1899, from Mr. Lemoine's Nurseries of Nancy. It flowered in the Temperate House in April of this year.

NOVEMBER 1ST, 1901.

Descr.—A nearly glabrous shrub, eight to ten feet high. *Leaves* not fully developed till flowering time, rhomboidal-ovate or orbicular, two to three and a half inches in diameter, cuspidately acute or acuminate, rather coriaceous, green, with often reddish margins, base rounded or openly cordate, russet red on maturing; petiole one half to one inch long. *Flowers* in a shortly peduncled, broadly oblong or globose, dense-flowered thyrsus, very shortly pedicelled, branches, pedicels, and calyces puberulous. *Calyx* one-tenth of an inch long, cleft nearly to the middle into four unequal, ovate-lanceolate, acute lobes. *Corolla* pale lilac, tube about half an inch long, glabrous or slightly glandular; limb two-thirds of an inch broad; lobes flat or slightly concave, orbicular or broadly elliptic. *Fruit* unknown.—*J. D. H.*

Fig. 1, calyx, style, and stigma; 2, section of corolla; 3, pistil:—*all enlarged.*

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TAB. 7808.

EUCALYPTUS GUNNII,

Var. MONTANA.

Native of Tasmania and Victoria.

Nat. Ord. MYRTACEÆ.—Tribe LEPTOSPERMEÆ.

Genus EUCALYPTUS, *L'her.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 707.)

EUCALYPTUS (Strongylanthera) *Gunnii*; arbor altitudine varia nunc valde elata, glaberrima, trunci cortice fragili inferne ruguloso superne ramorumque lævi, ramis patulis, foliis alternis petiolatis ovatis v. ovato-lanceolatis acuminatis rectis rigidis utrinque pallide viridibus basi acuminatis cuneatisve, nervis glandulisque obscuris, primariis oppositis sessilibus rotundatis pruinosis, umbellis axillaribus lateralibusque 3-pluri-floris subsessilibus v. pedicellatis, calycis tubo ad $\frac{1}{6}$–$\frac{1}{4}$ poll. longo obovoideo v. turbinato, margine acuto, operculo tubo multo breviore hemispherico vel conico et umbonato, filamentis $\frac{1}{6}$–$\frac{1}{4}$ poll. longis alabastro inflexis, antheris brevibus oblongis obovatisve rimis elongatis dehiscentibus, stylo brevi, capsula pyriformi truncata ore paullo constricta tereti 3–5-loculari margine angusto, valvis brevibus deltoideis leviter immersis, seminibus inappendiculatis.

Var. *montana*; arbor parva, foliis ad 2 poll. longis, umbellis paucifloris. E. Gunnii, *Hook. f. in Hook. Lond. Journ. Bot.* vol. iii. (1844) p. 499; *Fl. Tasman.* vol. i. p. 134, t. 27. *Benth. Fl. Austral.* vol. iii. p. 246. *F. Muell. Eucalyptogr. Dec.* iv.; *Key Syst. Vict. Pl.* i. 240. E. ligustrina, *Miq. in Ned. Kruidk. Arch.* vol. iv. (1859) p. 134 (non D.C.). Tab. nostr. 7808.

Var. *elata*; arbor elata, foliis longioribus, umbellis plurifloris. E. Stuartiana, *F. Muell. ex Miq. l.c.* vol. iv. (1859) p. 131; *Eucalyptogr. Dec.* iv. E. persicifolia, *Miq.* l.c. p. 137 (*non Lodd.*). E. Baueriana, *Miq. l.c.* p. 137 (*non Schau.*) E. falcifolia, *Miq. l.c.* p. 136 (*partim.*) E. acervula, *Hook. f. Fl. Tasman.* vol. i. p. 135 (*non Sieb.*). E. Gunnii, *F. Muell. Fragment.* vol. ii. p. 62 (*non Hook. f.*).

The species of *Eucalyptus* are notoriously variable, and difficult of discrimination. *E. Gunnii* forms no exception, and has given rise to a difference of opinion as to its limits of variation between Mr. Bentham and Baron Mueller, both able monographers of the genus. The species was discovered by myself in 1840, forming a forest of small trees in a swampy soil at elevations of three thousand to four thousand feet in the centre of Tasmania, where it was known to stock-keepers as yielding abundantly an agreeable sap; and hence called cider-tree or swamp-gum. This Tasmanian mountain form was subsequently found in the Victorian Alps, on the summit of the

Baw-Baw mountains, by Mueller, at an elevation of five thousand feet. It is characterized by its small stature, leaves about two inches long, and three- to four-flowered, shortly peduncled umbels. In 1859 Miquel published an allied species, *E. Stuartiana*, inhabiting low levels, characterized by its great size, attaining two hundred and fifty feet in height, longer leaves, more slender peduncles, with more numerous flowers in the umbels. It is the *E. Gunnii* of Mueller's Fragmenta cited above, the *E. acervula* of my "Flora Tasmanica" (not of Sieber), and has other synonyms. Bentham retains both species, but Mueller, being informed by Mr. Abbot, of Tasmania, a very competent observer, that *E. Gunnii*, in descending from the mountains to low levels, passes gradually into *E. Stuartiana*, has united the two, and in so doing has greatly added to the geographical range of the species, for the *Stuartiana* form not only ranges over Tasmania, but from Lake Bonney and Guichen Bay, in South Australia, to Gipp's Land in Victoria, and to Bathurst Plains and Two-fold Bay in New South Wales.

E. Gunnii is the only species that has withstood the climate of the east of England. A small tree of it (formerly misnamed *E. polyanthemos*) stood for many years on a mound by the pond opposite the Palm House, in the Royal Gardens, Kew, where it was cut almost to the ground by severe cold in several winters, but as often sent up from the trunk one or more branches from ten feet to twenty feet high. A specimen in my garden, near Sunningdale, at an elevation of about two hundred feet, is now thirty feet high. It has suffered severely by frosts, but has survived them. In the West of England and of Scotland it is quite hardy. As a species it is remarkable for the obscure development of oil glands, and faint odour of the foliage, which is hence browsed upon in Australia by cattle and sheep. Mueller gives several Colonial names for it, besides that under which I knew it, as Red gum-tree of Tasmania, Gumtop-tree of Sealer's Cove, and But-But, or Apple-scented Gum. The specimen here figured is taken from the plant that flowered in the Temperate House at Kew.

Descr.—A rather slender tree, variable in height, from twenty feet to thirty feet in the mountains of Tasmania,

to two hundred and fifty feet in the low levels; bark rather rough, flakeing. *Leaves* or young plants opposite, sessile, ovate, very glaucous; on old plants petioled, ovate-oblong to lanceolate, three inches to four inches long, acute, coriaceous, pale green on both surfaces; base acute, with the sides equal, or nearly so; nerves and oil glands very obscure. *Peduncles* solitary, axillary, short, stout, subterete, one- to three-flowered in the mountain form, longer, and four- to ten-flowered in the lowland. *Calyx-tube* urn-shaped, turbinate or obovoid, tapering at the base, one-sixth to one-fourth of an inch long. *Operculum* much shorter than the calyx-tube, hemispheric or conical and umbonate. *Filaments* about as long as the calyx-tube, inflexed in bud; anthers short, with long slits. *Style* short. *Capsule* pyriform, terete; mouth truncate, slightly constricted, margins acute; three- to five-celled; valves short, deltoid, incurved. *Seeds* inappendiculate.—*J. D. H.*

Fig. 1 and 2, calycine cup and operculum: *enlarged*; 3, umbel with unexpanded flowers, and 4, with expanded flowers of var. *elata*, of *nat. size*.

2

4

3

1.

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Tab. 7809.

IMPATIENS psittacina.

Native of Burma.

Nat. Ord. Geraniaceæ.—Tribe Balsamineæ.

Genus Impatiens, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 277.)

Impatiens (Unifloræ) *psittacina*; annua, erecta, foliosa, ramulis teretibus coloratis, foliis alternis breviter petiolatis ovatis argute serrulatis, dentibus eglandulosis, basi rotundatis subtus ad insertionem petioli glandulis 2 clavellatis erectis instructis, petiolo basi eglanduloso, floribus axillaribus solitariis 2 poll. longis pallide lilacinis roseo et kermesino pictis, pedicello pollicari decurvo basi v. supra basin bracteolis 1 v. 2 minutis subulatis instructo, sepalis 2 herbaceis oblongo-rotundatis, vexillo orbiculari $\frac{2}{3}$ poll. lato emarginato concavo ecostato pallide roseo, alis $1\frac{1}{2}$ poll. longis lobo basilari rotundato concavo erecto terminali paullo longiore recurvo oblique oblongo apice rotundato roseo fasciato, labello amplo incurvo conico-campanulato albo dorso kermesino basi in calcar breve uncinato-incurvum kermesinum abrupte constricto, filamentis elongatis gracilibus decurvis antheris brevibus, ovario elongato.

The Cockatoo Balsam.

In the absence of fruit, which did not ripen in the plant at Kew, I am unable to determine the affinity of this strikingly beautiful Balsam. It is described by Mr. Hildebrand, its discoverer in the Shan States of Upper Burma, as a pretty, compact plant, from one and a half feet to two and a half feet high, covered with flowers which resemble a Cockatoo suspended by a string from the shoulders, whence its name. I find no specimen at all resembling it in the Kew Herbarium, or in that of the Herbarium of the Royal Gardens, Calcutta, of which the Balsams have been entrusted to me for study and verification. Unfortunately good collections of the Balsams of Burma have never been made, and those that have been collected (about twenty species are known to me) are mostly dried without sufficient care. Sir Dietrich Brandis, who spent much time on forest duties in Burma, tells me that the genus swarms in that country, and that a rich harvest remains for a botanist who will devote his attention to them.

I. psittacina was raised from seed presented to the Royal

Gardens in 1899 by A. H. Hildebrand, Esq., C.I.E.; it flowered in a stove in October, 1900. The flowers assume a blue colour on fading.

Descr.—An erect, much-branched, leafy herb. *Stem* and *branches* rather stout, terete, coloured. *Leaves* two to three inches long, ovate, acuminate, serrulate, base rounded, with two clavate, erect glands on the under-surface at the point of attachment of the petiole which is eglandular. *Flowers* axillary, solitary, two inches long, pendulous from an arching peduncle an inch long, which bears one or two minute setaceous bracteoles, near, or above the base. *Sepals* two, orbicular-oblong, obtuse, green. *Standard* orbicular, concave, pale rose-coloured, two-thirds of an inch broad. *Wings* one and a half inches long; basal lobe orbicular, concave, erect; terminal longer, obliquely oblong, recurved, suffused and streaked with red. *Lip* as long as the wings, conico-campanulate, in-curved, narrowed at the base into a short, hooked spur, white with an irregular dash of bright carmine on the convex surface towards the base; mouth large, with an obtuse apex.—*J. D. H.*

Fig. 1, undersurface of base of leaf, showing the glands; 2, wing-petal; 3, stamens; 4, young pistil:—*all enlarged.*

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Tab. 7810.

SPIRÆA Millefolium.

Native of California.

Nat. Ord. Rosaceæ.—Tribe Spiræeæ.

Genus Spiræa, *Linn.*; (*Benth. & Hook. f. Gen. Plant.* vol. i. p. 611.)

Spiræa (Chamæbatia) *Millefolium*; fruticulus foliosus, erectus, ramosus, totus petalis exceptis glandulosus et pilis stellatis pubescens, ramis ramulisque robustis, foliis sparsis et versus apices ramulorum fasciculatis subsessilibus linearibus lineari-oblongis v. ovato-lanceolatis 2–3 poll. longis $\frac{2}{3}$–1 poll. latis pinnatis, segmentis creberrimis lineari-oblongis obtusis crenato-lobulatis supra saturate viridibus subtus pallidis, stipulis linearibus integerrimis, floribus in paniculas terminales erectas ramulosas densifloras dispositis breviter pedicellatis $\frac{1}{2}$–$\frac{1}{3}$ poll. latis, bracteolis oblongis, calycis tubo hemispherico v. turbinato, lobis erectis ovatis obtusis v. subacutis, petalis orbiculatis albis retusis calycis lobis duplo longioribus, filamentis brevibus, carpellis 5 pilosis 6–8-ovulatis, stylis gracilibus glabris, seminibus $\frac{1}{12}$–$\frac{1}{8}$ poll. longis.

S. Millefolium, *Torr. in Pacif. Rail. Rep.* vol. iv. (1856) p. 83, t. 5. *Coulter in Hayd. Rep.* 1872, p. 764. *S. Watson, Pl. Wheeler*, p. 8. *Brew. & Wats. Bot. Calif.* vol. i. p. 170. *W. J. B. in Gard. Chron.* 1897, vol. ii. p. 237, fig. 72. *Micheli in Rev. Hortic.* 1900, p. 514, fig. 233. *Sargeant, Gard. & For.* vol. ii. (1889) p. 508, fig. 137.

Chamæbatiaria Millefolium, *Maxim. in Act. Hort. Petrop.* vol. vi. (1879) p. 225. *Coulter, Man. Bot. Rocky Mt. Region*, p. 78.

Chamæbatia (*Sphalm.* pro Chamæbatiaria) foliolosa, *Newberry in Pacif. Rail. Rep.* vol. vi. (1873) p. 73.

The *Spiræa* here figured differs much in habit from its congeners, and is remarkable for emitting an odour of creosote. It was discovered in West Arizona, in 1853, by Dr. J. M. Bigelow, and has since been collected on the Sierra Nevada of California, at ten thousand feet elevation, in latitude 36° 30′ N., in S. Utah, and as far north as W. Wyoming Territory, but does not appear to extend further north on the Sierra Nevada, or south along the Rocky Mountains of Colorado than the positions here given. Its resemblance in foliage to *Chamæbatia foliosa*, Benth., t. 5171, also a native of California, is very striking.

The specimen of *S. millefolium* here figured, which is from a bush three feet high, was raised in the Royal Botanic Gardens, Kew, from seeds sent by Professor

Sargent from the Arnold Arboretum, near Boston, U.S.A., in 1891. It flowered in the open air in July, 1901.

Descr.—A stout, erect shrub, covered with glandular hairs and a minute stellate pubescence. *Leaves* two inches to three inches long, scattered or crowded towards the ends of the branchlets, sessile, linear-oblong or ovate-lanceolate, very closely pinnatisect, rhachis stout; pinnules linear, obtuse, very dark green above, pale beneath, pinnatifid; lobes short, obtuse, pale green beneath. *Stipules* linear, quite entire. *Flowers* crowded in erect, terminal, branching panicles, the lower branches of which are subtended by leaves, very shortly pedicelled, one half to two-thirds of an inch broad. *Calyx-tube* hemispheric or turbinate; lobes ovate, obtuse or sub-acute. *Petals* orbicular, white. *Filaments* short, anthers yellow. *Carpels* hairy, with glabrous styles, six- to eight-ovuled. *Seeds* about one-tenth of an inch long.—*J. D. H.*

Fig. 1, unexpanded flower and bracteoles; 2, stellate hairs; 3 and 4, stamens; 5, pistil:—*all enlarged.*

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TAB. 7811.

MEGACLINIUM LEUCORHACHIS.

Native of Lagos.

Nat. Ord. ORCHIDEÆ.—Tribe EPIDENDREÆ.

Genus MEGACLINIUM, *Lindl.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 505.)

MEGACLINIUM *leucorhachis*; rhizomate valido repente, pseudobulbis 2–3-pollicaribus ovoideo-oblongis compresso-4-gonis lævibus 2-foliatis, foliis 4–7 poll. longis 1–1¼ poll. latis linearibus v. anguste oblanceolatis obtusis crasse coriaceis læte viridibus rubro marginatis, pedunculis ascendentibus subfalcatis 4–6 poll. longis vaginis remotis spathaceis appressis ½ poll. longis brunneis instructis, rhachi florifera 3–5-pollicari falcata ensiformi ⅓–½ poll. lata leviter compressa alba multiflora, internodiis ad ⅙ poll. longis, bracteis distichis ¼ poll. longis patenti-reflexis late ovatis acutis membranaceis brunneis persistentibus, floribus distichis breviter pedicellatis ⅓ poll. longis decurvis velutinis croceis, sepalo dorsali erecto lineari-lanceolato, lateralibus brevioribus oblique late ovatis subacutis, petalis sepalo dorsali æquilongis linearibus erectis falcatis, labello parvo linguæformi recurvo basin versus utrinque fimbriato, columna latiuscula apice angustata bidentata.

M. leucorhachis, *Rolfe in Kew Bulletin*, 1891, p. 198; *et in Dyer Fl. Trop. Afr.* vol. vii. p. 37.

The genus *Megaclinium* is wholly African; it is closely allied to *Bulbophyllum*, differing chiefly in the dilated, flattened rhachis of the inflorescence, distichous flowers, and in the dorsal sepal being much longer than the lateral. Twenty species are described in the "Flora of Tropical Africa," of which three have been previously figured in this work, namely, *M. maximum*, Lindl. *Gen. & Sp. Orch.* p. 47; (M. purpuratum, *Lindl. in Journ. Linn. Soc. Bot.* vol. vi. p. 128, tab. nostr. 5936) in which the lateral sepals are nearly as long as the dorsal, *M. Lindleyi*, Rolfe (M. maximum, *Lindl. in Bot. Reg.* tab. 1959, tab. nostr. 4028, and *M. minutum*, *Rolfe* (tab. nostr. 7314). All are natives of West Tropical Africa.

M. leucorhachis was sent to the Royal Gardens, Kew, in 1896, from Lagos, in the Gulf of Guinea, by Mr. H. Millen, Curator of the botanical station in that colony. It flowered in a tropical house in April of this year.

Descr.—*Rootstock* stout, creeping. *Pseudobulbs* two inches to three inches long, obovoid-oblong, compressed,

smooth. *Leaves* two, four to seven inches long, one to one and a quarter inch broad, linear or narrowly oblanceolate, obtuse, coriaceous, bright green, margined with red. *Peduncle* ascending, bearing brown, distant, appressed, spathaceous bracts, half an inch long. *Spike* three to five inches long, by a third to half an inch broad, falcate, compressed, many-flowered, white; internodes one-sixth of an inch long. *Bracts* a quarter of an inch long, spreading, and reflexed, broadly ovate, acute, membranous, brown. *Flowers* one-third of an inch long, shortly pedicelled, decurved, velvety, yellow. *Dorsal sepal* erect, linear-lanceolate, lateral shorter, broadly ovate, sub-acute. *Petals* as long as the dorsal sepal, erect, linear, falcate. *Lip* small, tongue-shaped, recurved, fimbriate towards the base.—*J. D. H.*

Fig. 1, flower; 2, lip and column; 3, front view of column; 4 and 5, pollinia:—*all enlarged.*

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* *N. malvacea* in postscript.

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