

IX. *Description of some New Genera and Species of Tropical Leguminosæ.*

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(Plates XXXIII.—XLIII.)

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I. MICROCHARIS, Benth. in Benth. et Hook. f. Gen. Pl. 501.

(Tribe GALEGEÆ. Tropical Africa.)

CHAR. GEN. Calycis parvi patentis lobi subæquales. Vexillum suborbiculatum, patens, lateribus reflexis, in unguem angustatum; alæ oblique obovato-oblongæ, carinæ vix adhærentes; carina obtusa, alis brevior. Stamen vexillare ima basi cum cæteris cohærens, a medio liberum, cætera in vaginam conata; antheræ uniformes. Ovarium sessile, pluriovulatum, in stylum brevem attenuatum, stigmatate capitato subdiscoideo. Legumen lineare, compressum, membranaceum, 2-valve, intus inter semina tenuiter septatum. Semina transverse oblonga v. quadrata, estrophiolata, funiculis brevissimis.—Herbæ graciles, ramosæ, pilis simplicibus hispidæ. Folia simplicia, subsessilia. Stipulæ herbacæe v. subulatæ, persistentes. Flores minimi, rubri, in racemos axillares dispositi. Bracteæ angustæ; bracteolæ 0.

The slender annuals with little scarlet flowers which constitute this genus are perhaps not uncommon in some parts of Tropical Africa; but being easily overlooked in the luxuriant vegetation of the moist regions they inhabit, they have only recently come to the knowledge of botanists. The first specimens seen were in the late Dr. Vogel's collections in the first Niger Expedition, and were stated on the ticket to have been gathered by his friend and companion, Dr. Roscher. They were, however, imperfect; and having probably been considered insufficient for identifying with any old genus, or describing as a new one, they were omitted in Hooker's 'Niger Flora.' Since then very complete specimens in flower and fruit were transmitted by the late Mr. Barter, who found them abundant after the rains in crevices of rocks on the Nupe, and also at Jeba on the Quorra; and a single specimen, in flower and young fruit, of what appears to be a second species of the same genus, was gathered by Dr. Kirk near Luabo, on the left bank of the Zambesi.

The general aspect of the genus is nearly that of some of the slender single-leaved Indigoferas or Tephrosias; but neither the inflorescence nor the floral characters agree precisely with either of those genera, and, technically, it appears to be more nearly allied to the tropical American and West-Indian Craccas. How far the two species here proposed may or may not prove to be varieties of one, can only be determined by a more extended series of specimens from intermediate stations.

The following are the specific characters of the two:—

1. M. TENELLA. (Plate XXXIII. A.) Foliis lanceolatis oblongisve, stipulis setaceis.

Caules graciles, laxè ramosi, 1-2-pedales, pilis patentibus hirti. Folia (sive foliola solitaria) late v. anguste lanceolata, rarius oblonga, acuta v. obtusiuscula, basi rotundata v. angustata, 1-1½ poll. longa, mem-

branacea, utrinque viridia, pilis longiusculis conspersa, in petiolum 1-2-linearem subarticulata. Stipulæ setaceæ, patentes v. incurvæ, rigidulæ, petiolo sublongiores. Racemi graciles, fere filiformes, folio sæpius longiores, hirti. Flores secus rhachin dissiti, ad axillam bractæ setaceæ v. subfoliaceæ solitarii, breviter pedicellati, vix 2 lin. longi. Calyx brevis, pilis longiusculis rigidis hirtus. Petala pallide coccinea, glabra. Legumen leviter falcatum, hirtum, perfectum 8-9 lin. longum, 1 lin. latum, sed sæpe abortu brevius.

Hab. West tropical Africa. Rocks on the Niger (*Vogel, Barter*).

2. *M. LATIFOLIA.* (Plate XXXIII. B.) Foliis ovatis v. ovato-lanceolatis, stipulis late semicordatis subreniformibusve acuminatis.

Folia (sive foliola solitaria) 2 poll. longa, 1 poll. lata. Stipulæ foliaceæ, 2-4 lin. latæ. Cætera *M. tenella*, cujus forte varietas est insignis.

Hab. East tropical Africa. Near Luabo on the Zambesi (*Kirk*).

II. GEISSASPIS, W. et Arn.; Benth. et Hook. f. Gen. Pl. 516.

(Tribe HEDYSARÆÆ. Tropical Asia and Africa.)

I refer to this well-known small genus for the purpose of characterizing a remarkable West-African species, in which the large bracts have not the marginal cilia of the common *G. cristata*. This plant has long been in our herbaria, having been gathered by Heudelot in Senegambia, and communicated by M. Delessert to Sir W. Hooker, as well as to myself, as early as 1838. In the Hookerian herbarium it has been correctly determined to be a *Geissaspis* by Dr. Planchon; but I do not find that it has ever been published as such. It is probable, however, that it is identical with the *Sæmmeringia psittacorhyncha* described by Webb, in his 'Spicilegia Gorgonea,' from a Cape-de-Verd-Island specimen which I have been unable to see. The character given is quite at variance with that of the Brazilian genus *Sæmmeringia*, and agrees, in all essential points, with our Senegambian *Geissaspis*.

The following are the technical characters of the species:—

G. LUPULINA, Planch. in herb. Hook. Stipulis latis basi oblique subcordatis vix productis, bracteisque integerrimis.

Herba annua glaberrima. Foliola 3-6-juga, anguste cuneato-oblonga, obtusissima, pleraque semipollicaria, petiolo communi gracili $\frac{1}{2}$ - $\frac{3}{4}$ poll. longo. Stipulæ foliaceæ, oblique obovatæ v. subreniformes, 3-6 lin. longæ, basi sessiles v. hinc in auriculam minimam obtusam productæ. Spicæ lupulinæ, demum 1-2-pollicares, pedunculo foliis longiore fultæ. Bracteæ ut in *G. cristata* amplæ, oblique reniformes, venosæ, imbricatæ, 6-9 lin. latæ, sed integerrimæ nec ciliatæ. Petala bracteas parum excedentia. Flores et legumina cæterum omnino *G. cristatæ*.

Hab. West tropical Africa. Moist light soils on the banks of the Casamance, in Senegambia (*Heudelot*, nn. 555 and 664).

III. DESMODIUM, DC.; Benth. et Hook. f. Gen. Pl. 519.

(Tribe HEDYSARÆÆ. Tropical and Subtropical Asia, Africa, and America, North America, Japan, Australia.)

This large offset from the old genus *Hedysarum* has been irregularly split up by various botanists, but chiefly by separating as distinct genera isolated species which pre-

sented characters that had not been observed in others. In the first general sketch of the group which I made for the 'Plantæ Junghuhnianæ,' it appeared to me that if the universally adopted genera *Dicerma* and *Nicolsonia* of De Candolle were maintained, it would be necessary to keep up several others, and even to establish new ones, for which I gave characters in a note to that work. I have, however, since then had occasion to examine in detail above a hundred species, besides numerous varieties published as species; and the characters relied on for the separation of the smaller genera have proved too uncertain or too artificial to be available for any but sectional divisions; so that in our 'Genera Plantarum' I have found it necessary not only to restore the genus to the extent originally contemplated by De Candolle, but to add to it his *Dicerma* and *Nicolsonia*, which are now shown to be less different from several of his *Desmodiums* than these are from each other. The minor characters have served to distinguish twelve sections, besides four subsections of *Heteroloma*; and it is with much hesitation that I refrained from adding to them the small or monotypic genera *Ougeinia*, Benth., *Mecopus*, Benn., and *Pseudarthria*, W. et Arn., closely connected as they are with some species of true *Desmodium*. On the other hand, the pod of *Nicolsonia congesta*, Wight, is so very different from that of all the other sections, that I have been obliged to raise it to the rank of a genus, under the name of *Leptodesmia*, which I had formerly proposed as sectional in *Desmodium*, the two species described in the 'Plantæ Junghuhnianæ,' ix. 222, taking the names of *L. congesta* and *L. lespedezioides*.

Among the recent additions to *Desmodium* are the two following, remarkable for their pinnate leaves with more than three leaflets (an exceptional form which, in the whole subtribe of *Desmodiæ*, had hitherto been known only in a very few species of *Uraria*):—

D. (HETEROLOMA) PYCNOSTACHYUM, sp. n. Foliis pinnatis, foliolis quinque ovali-ellipticis oblongisve obtusissimis v. emarginatis supra glabris subtus ramisque pilis raris conspersis, stipulis subcordatis patentissimis, racemis densis terminalibus, bracteis parvis caducissimis, pedicellis brevibus, legumine hamato-pubescente pluriarticulato sutura superiore subcontinua inferiore profunde sinuata.

Erectum videtur, ramosum et forte fruticosum. Foliola fere *D. concinni* at semper in speciminibus 5; terminale 1-1½-pollicare, lateralia minora. Stipulæ siccæ rigidulæ, acuminatæ, striatæ, 1-2 lin. longæ, demum deciduæ. Inflorescentia, flores et fructus fere *D. polycarpi*; bracteæ tamen parvæ, setaceo-acuminatæ nec comosæ.

Hab. Isle of Pines, off the coast of New Caledonia (*M^cGillivray*).

D. (HETEROLOMA, PODOCARPIA) OLDHAMI, Oliv. in Journ. Linn. Soc. ix. 165. Foliis pinnatis, foliolis subseptenis ovato-lanceolatis pilis adpressis conspersis, racemo elongato longe pedunculato laxè pubescente, bracteis angustis persistentibus, leguminis longe stipitati articulis paucis longe semiovatis.

Caules elongati, simplices v. parum ramosi. Folia pauca, foliolo terminali 1½-2½-pollicari, lateralibus minoribus. Racemi semipedales, rigiduli. Bracteæ lineari-lanceolatæ. Pedicelli solitarii v. gemini altero abbreviato. Calyx fere cyathiformis. Leguminis nondum maturi stipes 3 lin. longus; articuli 1-2, fere triangulares, 3 lin. longi, medio 1½ lin. lati.

Hab. Japan (*R. Oldham*, 1862).

IV. MASTERSIA, Benth. in Benth. et Hook. f. Gen. Pl. 535.

(Tribe PHASEOLEÆ. Tropical Asia.)

CHAR. GEN. Calycis lobi 2 superiores in unum integrum latum connati. Vexillum suborbiculatum, brevissime unguiculatum, exauriculatum; alæ oblique oblongæ; carina lata, leviter incurva, obtusa, alas subæquans. Stamen vexillare liberum, filamento filiformi a basi recto; antheræ (5? v. omnes?) lineares, versatiles. Ovarium sessile, multiovulatum; stylus brevis, incurvus, filiformis, imberbis, stigmate capitato. Legumen oblongo-lineare, plano-compressum, indehiscens, sutura superiore anguste subalata. Semina plurima, parva, transverse oblonga, hilo parvo laterali, funiculo filiformi.—Caulis alte volubilis. Folia pinnatim 3-foliolata, foliolis amplis stipellatis. Flores in pedunculis elongatis axillaribus fasciculato-racemosi, fasciculorum rhachi nodiformi. Bracteæ caducissimæ; bracteolæ suborbiculatæ, diutius persistentes.

The plant upon which I propose to found this genus is a large twiner, collected many years since by Drs. Wallich and Griffith in their joint expedition into the Assam tea-country. The majority of specimens are in fruit only, but a few flowering ones from Dr. Griffith's collection, although not in a very good state, have proved sufficient to complete the generic character. The affinity is evidently with *Pueraria* and *Dioclea*, both as to habit and the general structure of the flower; but the stamens are different, and the thin flat indehiscent pod and the position of the seeds are quite anomalous amongst *Phaseoleæ*.

I have dedicated the genus to Mr. Masters, after whom his friend the late Dr. Griffith, in testimony of his assiduous investigation of the Assam flora, had named a genus which afterwards proved to have been previously published under another name. We may, however, also consider *Mastersia* as commemorating the labours of Dr. T. Maxwell Masters, F.L.S., several of whose papers on Vegetable Teratology, as well as on Systematic Botany, have already appeared in the publications of our Society.

The following is the detailed description of the species:—

M. ASSAMICA, sp. n. (Plate XXXIV.)

Caulis alte volubiles, glabriusculi. Foliorum petiolus communis semipedalis; foliola late ovata, breviter acuminata, 3-6 poll. longa, integra, tenuiter coriacea, supra glabra, subtus pilis adpressis conspersa, petiolulo 2-3 lin. longo. Stipulas caducissimas non vidi; stipellæ rigidulæ, lanceolatæ v. oblongæ. Racemi pedales et longiores, nonnunquam prope basim folium ferentes. Florum fasciculi dissiti, rhachibus interdum demum paullo elongatis, vix tamen lineam attingentibus. Pedicelli graciles, pubescentes, 2-3 lin. longi. Bracteæ ad nodum quemque 2, oppositæ, ovatæ, 3-4 lin. longæ, præter cilia marginalia glabræ, longe ante anthesin caducæ. Bracteolæ suborbiculatæ, 2 lin. longæ. Calycis tubus 1 lin. longus; lobi acuti, superiores 3 lin. longi, summo latissimo, lateralibus angustis, infimus longior, arcuatus, carinatus. Vexillum fere 6 lin. longum; petala inferiora vix breviora. Ovarium villosum. Legumen sessile, tenue sed rigidulum, glabrum, nitidum, 2-4 poll. longum, $\frac{3}{4}$ -1 poll. latum. Semina plus quam 20, in medio legumine 1-seriatim disposita.

Hab. East India. Mishmee hills, and near Choopura in Upper Assam (*Wallich and Griffith*).

V. PANUREA, Spruce, in Benth. et Hook. f. Gen. Pl. 550.

(Tribe SOPHOREÆ. Tropical America.)

CHAR. GEN. Calycis oblique turbinati lobi breves, lati; 2 superiores in labium bidentatum connati. Petala breviter unguiculata; vexillum suborbiculatum; alæ oblique ovatæ; carinæ petala libera, alis breviora

sed cæterum similia. Stamina libera; antheræ parvæ, subglobosæ. Ovarium sessile, pauciovulatum; stylus brevis, crassus, uncinato-inflexus, stigmatè terminali truncato. Legumen planum, acuminatum, bivalve. Arbor ramosissima. Folia simplicia, ampla, penninervia. Stipulæ parvæ. Flores parvi, racemosi, racemis brevibus ad axillas breviter subpaniculatis. Bracteæ parvæ, caducæ; bracteolæ minutæ v. inconspicuæ.

Species unica P. LONGIFOLIA, Spruce, MS. (Plate XXXV.)

Arbor fide Sprucei 20–30-pedalis, ramis adscendentibus, tota glabra exceptis inflorescentia ramulisque novellis tenuissime rufo-tomentellis. Folia (foliola solitaria?) oblongo-elliptica, breviter acuminata, basi obtusa, coriacea, nitidula; maxima ultrapedalia, suprema multo minora; petiolo (petiolulo?) brevi crasso fulta. Racemi 1–3-pollicares, ad axillas solitarii v. subfasciculati, simplices v. ramosi. Pedicelli solitarii v. subfasciculati, calyce subbreiores. Calyx $1\frac{1}{2}$ lin. longus. Petala ochroleuca, calyce vix duplo longiora.

Hab. Tropical America. Caatingas near Panuré, on the Rio Uaupés, in North Brazil; gregarious, and often covering acres of ground among the scattered large forest-trees (*R. Spruce*, n. 2586).

The inflorescence, the small flowers, and in a great measure the calyx, petals, and even the anthers, are very near those of *Dalbergia*; but the stamens are entirely free, placing the genus amongst *Sophoreæ*, where I know of no one resembling it in other respects. I have not seen the pod: Mr. Spruce describes it as flat, rather broad, acuminate, and 2-valved, and he believes he had laid some in with the specimens; but they appear to have been unfortunately lost before transmission to this country.

VI. CAMOËNSIA, Welw.; Benth. et Hook. f. Gen. Pl. 557.

(Tribe SOPHOREÆ. Tropical Africa.)

CHAR. GEN. Calycis campanulati v. longissimi lobi imbricati. Petala papilionacea, unguiculata, corrugata; vexillum late orbiculatum; 4 inferiora lato-ovata v. anguste cuneata, libera. Stamina libera; antheræ uniformes, lineares, versatiles. Ovarium stipitatum, pluriovulatum; stylus filiformis, in alabastro involutus, stigmatè terminali parvo v. capitato. Legumen lato-lineare, plano-compressum, crasso-coriaceum, bivalve. Semina transversa, obovata, compressa; albumen 0; radícula brevis, recta.—Frutices alte scandentes. Folia digitatim 3-foliolata, foliolis amplis coriaceis petiolulatis. Flores speciosi, racemosi, racemis in axillis superioribus simplicibus. Bracteæ et bracteolæ breves, caducæ.

This genus stands alone in *Leguminosæ*, as combining the lofty climbing woody stem and habits of many *Dalbergiæ* with the digitately trifoliolate leaves of *Podalyriæ* and *Genisteæ*, whilst the flowers place it amongst *Sophoreæ*. Both the species known are amongst the handsomest of the Order, and the flowers of one are certainly the largest hitherto known. It has therefore been appropriately dedicated by Dr. Welwitsch to the celebrated Portuguese poet Luis Camoes, author of the ‘Lusiade,’ in which is introduced the voyage of discovery of Vasco di Gama, which he had himself accompanied in his youth as a soldier.

1. C. MAXIMA, Welw. (Plate XXXVI.) Calyce longissime tubuloso ovarioque rufo-lanatis.

“Frutex validus altissime scandens, dein graciose dependens” (*Welw.*). Specimina, inflorescentia excepta, glabra. Foliola ad apicem petioli, brevissime petiolulata, obovati-oblonga v. late elliptica, anguste acuminata, infra medium angustata, basi obtusa, tenuiter coriacea, reticulato-pennivenia,

6-pollicaria, petiolo communi foliolis brevior. Stipulæ nunc persistentes rigidæ conicæ incurvæ spinescentes, nunc evanidæ; stipellæ subulatæ. Flores maximi, penduli, in racemos breves axillares dispositi, rhachi bracteis calycibusque molliter rufo-lanatis. Pedicelli brevissimi, crassi. Bracteæ et bracteolæ linearilanceolatæ, setacæ, acuminatæ, caducæ. Calyces 6-7-pollicares, parte discifera tenuiore 3-4 poll. longa, parte libera paullo ampliore at pariter tubulosa, ad medium in labia 2 fissa, labio superiore breviter 2-fido, inferiore 3-partito, lobis margine leviter imbricatis, labii inferioris sæpius revolutis. Petala lactea, venosa, marginibus crispulis aureo-marginatis, in unguis calycis lobos subæquantibus angustata; vexillum suborbiculatum, calycem pollices 4 excedens; 4 inferiora minora et multo angustiora. Stamina petalis paullo breviora, glaberrima; antheris longe linearibus medifixis. Ovarium dense rufo-lanatum; stylus staminibus longior, superne glabratus, stigmatibus globoso-capitato. Legumen rufo-lanatum, angulo recto in stipitem recurvum, 6-8 poll. longum, 1-1½ poll. latum, suturis parum incrassatis. Semina sæpius 3-4.

Hab. West tropical Africa. Common in dense forests of the Golungo Alto, adorning the loftiest trees of the outskirts with its splendid bunches of pendulous milk-white flowers tinged with gold on the edge of the petals (*Welwitsch*). Specimens are also in the British Museum, from Afzelius's collection, of what appears to be a slight variety, with much smaller flowers, but of the same shape as in *Welwitsch*'s specimens, and much larger than in *C. brevicalyx*.

2. *C. BREVICALYX*, sp. n. Calyce late campanulato ovarioque minute tomentellis.

Frutex, fide Mannii alte scandens, glaber, excepta inflorescentia minute tomentella. Foliola ovali-elliptica v. late oblonga, obtusa v. brevissime obtuseque acuminata, demum coriacea nitida, pleraque 3-6-pollicaria, petiolulo 2-3 lin. longo fulta, petiolo communi foliolis parum brevior v. interdum longior. Stipulæ brevissimæ, latæ, squamiformes, rigidæ at non spinescentes; stipellas non vidi. Flores speciosi (albi?), in racemos axillares laxos pedunculatos foliis longiores dispositi. Pedicelli semipollicares. Bracteæ et bracteolæ breves, latæ, concavæ, squamiformes, deciduæ. Calyces subpollicares, parte discifera tenui ½ poll. longa, parte libera late campanulata, in alabastro angulata, per anthesin usque ad medium in lobos 5 leviter imbricatos divisa, superioribus vix altius connatis. Petala in unguis calyce longiores angustata; vexillum suborbiculatum lamina subsesquipollicari, 4 inferiora paullo breviora et angustiora. Stamina petalis paullo breviora. Ovarium stipitatum, rufo-tomentellum; stylus elongatus, superne glabratus, stigmatibus parvo. Legumen non visum.

Hab. West tropical Africa. On the river Muni, lat. 1° N. (*G. Mann*).

Had it not been for the comparison with its magnificent congener, this would have been reckoned a most showy large-flowered climber. I have not seen it in any other collection.

VII. BATESIA, Spruce, in Benth. et Hook. f. Gen. Pl. 563.

(Tribe SCLEROLOBIEÆ. Tropical America.)

CHAR. GEN. Calycis tubus discifer campanulatus; segmenta 5, imbricata. Petala 5, parum inæqualia, ovata, imbricata, summo intimo. Stamina 10, libera, filamentis basi villosis, vix declinatis; antheræ uniformes, loculis longitudinaliter dehiscentibus. Ovarium breviter stipitatum, in fundo calycis liberum, pauciovulatum, stipite apice oblique dilatato subarticulato; stylus brevissimus, crassus, stigmatibus terminali truncato concavo ciliato. Legumen breve, subfalcatum, compresso-turgidum, coriaceo-sublignosum, costis elevatis percursum, folliculatim dehiscens. Semina 2-3, transversa, suborbiculata, crasso-compressa, exarillata, albuminosa; cotyledones planæ, carnosulæ, basi cordatæ; radícula brevis recta.—Arbor procera, inermis. Folia ampla, imparipinnata, foliolis coriaceis. Flores lutei, racemosi, racemis ad apices ramorum in paniculam amplam ramosissimam dispositis. Bracteæ et bracteolæ angustæ, caducissimæ.

The genus thus named in honour of the distinguished traveller on the Amazons, H. W. Bates, Esq., is founded on a lofty tree discovered by Mr. Spruce in the forests bordering the Rio Uaupés in North Brazil, and referred doubtfully, in the distribution of his plants, to *Tachigalia*. It differs, however, from that genus in the unequally pinnate leaves and in the stipes of the ovary being entirely free from the calyx-tube (which remove it from the subtribe *Amherstieæ* to the *Sclerolobieæ*)—as well as in the pod, which is peculiar in its dehiscence. I am only acquainted with a single species:—

B. FLORIBUNDA, Spruce, MS. (Plate XXXVII.)

Arbor fide Sprucei 100-pedalis coma patula, ramulis inflorescentia petiolis foliolorumque pagina inferiore tenuiter rufo-tomentellis. Folia 1-2-pedalia; foliola sæpius 11, petiolulata, ovali-elliptica v. oblonga, acuminata, basi obtusa, 4-6-pollicaria, supra glabra nitidaque, subtus elevate pennivenia et transverse reticulato-venulosa. Petiolus communis angulatus, nonnunquam inter foliola ultima glandulas iis *Inga* subsimiles gerens. Flores aurei, odorati, in paniculas amplas floribundas terminales dispositi, secus ramulos ultimos racemosi. Bracteas non vidi; bracteolæ lineares, breves, caducissimæ. Calycis segmenta 3 lin. longa. Petala paullo longiora, anguste ovata, extus minute tomentella. Stamina petalis breviora, antheris ovatis. Legumen brevissime stipitatum, 1-1½ poll. longum, fere ¾ poll. crassum. Semina nitide coccinea.

Hab. Tropical America. Forests of the Rio Uaupés, in North Brazil (*R. Spruce*, n. 2780); distributed under the name of *Tachigalia*? *erythrosperma*.

VIII. DICYMBE, Spruce, in Benth. et Hook. f. Gen. Pl. 564.

(Tribe SCLEROLOBIEÆ. Tropical America.)

CHAR. GEN. Calycis tubus discifer turbinatus, crassus; segmenta 4, ovali-oblonga, imbricata, summo sæpe bifido. Petala 5, ovata, parum inæqualia, imbricata, summo intimo. Stamina 10, libera, filamentis inflexis basi pilosis; antheræ lineares, uniformes, loculis longitudinaliter dehiscentibus. Ovarium breviter stipitatum, in fundo calycis liberum, ∞ -ovulatum; stylus elongatus, æstivatione involutus, stigmatē peltato. Legumen . . . —Arbor. Folia abrupte v. subimparipinnata. Flores corymboso-paniculati. Bracteæ crassæ, cochleatæ, caducissimæ. Bracteolæ 2, crasso-coriacæ, sibimet valvatim applicitæ et ante anthesin globum constituentes alabastrum includentem, per anthesin apertæ, persistentes.

I had long hesitated whether or not to adopt this genus as distinct from *Thylacanthus*, Tul., the affinities with which were recognized by Mr. Spruce. Neither he nor myself have seen any specimen of Tulasne's plant; but, from the detailed description given by that author, the calyx divided to the base into 5 petal-like segments, the stamens united at the base, the short anthers, and the bracteoles united into a 2-lobed involucre are all incompatible with Spruce's plant, establishing differences analogous to those which separate *Brownea*, *Amherstia*, and their allies from each other. It is not impossible, however, that, when better known, it may be found advisable to reunite *Dicymbe* with *Thylacanthus*. It is said by Mr. Spruce to be a small but handsome tree, the large, thick, ivory-like bracteoles giving the inflorescence a remarkable aspect.

The following is the detailed description of the only species known:—

D. CORYMBOSA, Spruce, MS. (Plate XXXVIII.)

Arbor, fide Sprucei parva, raro altitudine 30 pedes attingens, plerumque 10-15-pedalis, inflorescentia excepta glabra, ramulis crassis. Folia sæpius abrupte pinnata, 2-juga, hinc inde 1- v. 3-foliolata;

foliola sæpe inæqualia, oblongo- v. ovali-elliptica, obtuse acuminata, basi angustata, coriacea, nitida, maxima fere pedalia, pleraque tamen dimidio minora, petiolo communi brevi, petiolulis brevissimis. Stipulæ ad folia adulta inconspicuæ. Flores majusculi, ad apices ramorum in corymbum fastigiatum dispositi, secus ramos breviter racemosi. Pedicelli rigidi, 2-pollicares. Bracteas non vidi. Bracteolæ eburneæ, subpollicares, crassissimæ, concavæ. Sepala seu calycis segmenta crassiuscula, bracteolis parum breviora, eburnea, extus puberula, summo latiore sæpe bifido. Petala sepalis paullo longiora et tenuiora, alba, margine undulata v. crispula, extus puberula. Ovarium breviter rufo-tomentosum, ovulis ad 8.

Hab. Tropical America. Common in the Caatingas or sandy woods near Panuré, on the Rio Uaupés, North Brazil (*Spruce*, n. 2791).

IX. GLEDITSCHIA, Linn. ; Benth. et Hook. f. Gen. Pl. 568.

(Tribe EUCÆSALPINIÆ. North America, temperate Asia, and tropical Africa.)

The affinities of this genus had much perplexed me; the inflorescence, small flowers, and general habit seemed to indicate an approach to *Mimoseæ*, but the floral characters are quite different; and I had not till lately the opportunity of examining any but male flowers of *Gymnocladus*, next to which it had been placed by De Candolle and others. Having now, however, received good hermaphrodite or female flowers from Dr. A. Gray, the close connexion of the two genera has become evident. Both have polygamous flowers, with the calyx-lobes not completely covering all the petals in the bud, so that some of the latter assume almost the appearance of sepals, as in some *Passifloreæ* and allied orders, but which is very unusual in *Leguminosæ*; and *Gymnocladus* occasionally has a few pinnæ of the leaves reduced to simple leaflets, as is frequently the case in *Gleditschia*. The chief differences consist in the larger flowers, longer calyx-tube, and thick pod of *Gymnocladus*; and both genera come well into *Eucæsalpinieæ*, next to *Acrocarpus* and *Wagatea*.

Gleditschia had hitherto been supposed to be confined to North America and temperate or subtropical Asia, our herbaria containing two species from North America, one or perhaps two from China, and one from the Caspian region; but, after the sheet of our 'Genera Plantarum' containing the genus had been printed off, Dr. Welwitsch communicated to me specimens of a distinct species gathered by him in the mountains of the Huilla district, in West tropical Africa. The generic characters are precisely those of the northern species, and the inflorescence that of *G. triacanthos*, or even more dense, whilst the pod is intermediate, as it were, between those of *G. caspica* and *G. monosperma*. The following are the detailed characters:—

G. AFRICANA, Welw. MS. Molliter pubescens, vix demum glabrescens, foliis (omnibus?) bipinnatis, foliolis ovatis obtusis retusisve, spicis densis, floribus subsessilibus molliter villosis, legumine subrecto oligospermo.

Arbor (fide Welw.) mediocris, coma dilatata, ramulis novellis foliis inflorescentiaque molliter pubescentibus villosisve. Foliorum pinnæ oppositæ, abrupte 3-4-jugæ v. rarius 2-3-jugæ cum impari; foliola in quaque pinna 8-13, alterna, $\frac{3}{4}$ -1 $\frac{1}{2}$ poll. longa, basi æqualiter obtusa v. obliqua, coriacea, juniora utrinque molliter villosa, adulta nonnunquam supra fere glabra nitidaque. Stipulæ inconspicuæ. Glandulæ interdum adsunt parvæ inter pinnas cujusve jugi. Spicæ molliter villosæ, densæ, v. basi

interruptæ, $1\frac{1}{2}$ -3 poll. longæ, sæpius paucæ in paniculam brevem terminalem dispositæ. Flores ex albido flavescens, sessiles, secus rhachin solitarii v. fasciculati, fasciculis infimis nonnunquam brevissime pedunculatis, plerique 5-meri, 2 lin. longi. Calycis tubus discifer turbinatus, lobi oblongo-lineares, obtusi, villosi, tubo paullo longiores, parum inæquales. Petala calycis lobos parum excedentia, angusta, villosa. Stamina inæqualia, petalis longiora, filamentis crassiusculis parce pilosis; antheræ ovatæ, purpureæ. Ovarium stipitatum, stipite a calyce libero, villosum, in stylum brevem glabrum attenuatum; ovula 6-8. Legumen stipitatum, planum, fere rectum, obtusum, coriaceum, glabrum v. pilis paucis conspersum, 4-6 poll. longum, 1 poll. latum, suturis vix incrassatis.

Hab. West tropical Africa. Gathered in the Huilla district in the dense rocky forests about Mumpulla, at an elevation of about 4000 feet (in flower and fruit), and in the district of Pungo Andongo, in the woods near Calundo, at an elevation of between 2400 and 3800 feet (in fruit only) (*Welwitsch*).

X. OLIGOSTEMON, Benth. in Benth. et Hook. f. Gen. Pl. 578.

(Tribe CASSIÆ. Tropical Africa.)

CHAR. GEN. Calycis tubus nullus; sepala 4, ampla, externo infimo subcoriaceo secundoque summo majore subpetaloideo ovatis integris, tertio ovato-lanceolato hinc basi sublobato, quarto profunde 2-lobo, lobis lanceolatis petaloideis sed aveniis. Petala 5, sepalis multo minora, 3 superioribus lanceolatis v. ovato-lanceolatis, summo extimo, 2 inferioribus minoribus linearibus. Stamina 5, rarius 4, filamentis brevissimis planis liberis; antheræ elongatæ, basifixæ, apice 2-fidæ, loculis acuminatis longitudinaliter sulcatis superne rima brevi dehiscentibus, 3 staminum superiorum dorso longitudinaliter connatæ, 1-2 laterales liberæ. Ovarium breviter stipitatum, longitudinaliter 4-alatum, 2-ovulatum; stylus crassiuscule filiformis, stigmatate parvo terminali. Legumen junius elongatum, acuminatum, longitudinaliter 4-alatum. Semina . . . —Frutex elatus. Folia imparipinnata. Flores in racemum terminalem dispositi.

The handsome, richly-flowering, tall shrub on which this genus is founded, a native of tropical Africa, is, like several others from the same country, perfectly isolated by its characters, combining those of very different tribes. The most important of them, and especially the structure and arrangement of the stamens, refer it, without doubt, to Cassiæ; whilst the æstivation of the petals, the upper one outside as in Papilionacæ, is, I believe, a solitary exception in the whole suborder of Cæsalpinieæ. In other respects the structure of the flower, as well as the habit, show considerable affinity to the Brazilian genus *Martia*; the veined petals are nearly those of *Tamarindus*. Our drawing was unfortunately taken from the first specimens we had, which were only commencing to flower. Others more advanced were afterwards received, in which the terminal raceme had lengthened to above a foot; and some of the pods were already much enlarged, but not nearly sufficiently so to ascertain their dehiscence, if any, or to show the structure of the seed. The following is the only species known:—

O. PICTUS, Benth. (Plate XXXIX.)

Frutex fide Mannii 12-20-pedalis, partibus novellis inflorescentiaque minute rufo-tomentellis, cæterum glaber. Foliola 7-9, petiolulata, opposita cum impari, obovali-elliptica, apice rotundata et abrupte acuminata, acumine mucronulato, basi acutiuscula, 4-5-pollicaria, tenuiter coriacea, pennivenia et reticulato-venulosa. Stipulæ parvæ, latiusculæ, acutæ, caducæ. Flores rosei, sepalis exterioribus brunneis, in racemum densum demum ultrapedalem terminalem dispositi. Pedicelli subsemipollicares v. demum longiores, crassiusculi, supra basin persistentem articulati, ad articulationem bibracteolati,

bracteolis bracteisque subtendentibus parvis squamiformibus caducis. Sepalum externum 9–10 lin., intermedia 12 lin., intimum 15 lin. longa. Petala eleganter venosa, 3 sepalis dimidio fere breviora, intermedio tamen lateralibus paullo longiore et acutiore, 2 parva angusta. Antheræ semipollicares. Legumen immaturum jam 5 poll. longum, 5 lin. latum.

Hub. West tropical Africa, on the Cameroon river (*G. Mann*).

XI. BANDEIRÆA, Welw., and Benth. et Hook. f. Gen. Pl. 577.

(Tribe BAUHINIÆ. Tropical Africa.)

CHAR. GEN. Calycis tubus discifer elongatus; limbus laxe campanulatus, lobis 5 brevibus latis subimbricatis.

Petala 5, oblonga, erecta, subæqualia, imbricata, summo intimo. Stamina 10, libera, glabra, subdeclinata; antheræ uniformes, versatiles, loculis longitudinaliter dehiscentibus. Ovarium longe stipitatum, stipite tubo calycis adnato et longe exserto, ∞-ovulatum; stylus brevis, stigmatē parvo terminali. Legumen longe stipitatum, oblique oblongum, compressum v. turgidum, stylo persistente infra apicem uncinatum, coriaceum, 2-valve. Semina 1 v. pauca (matura ignota).—Frutices alte scandentes. Folia simplicia (1-foliolata), pennivenia v. costis lateralibus tenuibus 3-nervia. Flores speciosi, racemis terminalibus simplicibus paniculatisve.

One species of this genus has long been known, and was described, above sixty years since, by Vahl, under the name of *Schotia simplicifolia*, which it has retained in all systematic works, without, however, having ever been reexamined, and with frequent doubts expressed as to its being rightly placed. The flowers have, it is true, individually, a general resemblance to those of a *Schotia*, but their structure, as well as the general habit of the plant, are much nearer to those of a *Bauhinia*. I had, indeed, some doubts whether it ought to be regarded as more than a section of that genus; for although the leaves have no tendency to the two lobes characteristic of the greater number of *Bauhinias*, nor have they even the three strong veins of the few entire-leaved species of that genus, yet there are generally, besides the midrib, a faint lateral one on each side, showing no absolute departure from the foliage of the tribe. The long-stalked short pod, however, with a remarkably hooked style, and the apparent difference in the foliage may be a sufficient warrant to adopt the genus as proposed by Welwitsch. He has dedicated it to the truly noble and enlightened Viscount Sa de Bandeira, recently raised to the dignity of Marquess de Bandeira, to whose exertions and patronage as Portuguese Minister of Marine Dr. Welwitsch mainly ascribes his having been able successfully to accomplish his arduous expedition into tropical Africa.

Our collections evidently contain two distinct species, which may be characterized as follows:—

1. *B. SPECIOSA*, Welw. MS. (Plate XL.) Foliis plerisque 3–5-nerviis, racemis tenuissime canescentibus, legumine stipite suo multo longiore oblique oblongo antice stylo recto mucronato.

Frutex ex Welwitschio scandens, nunc arbuscula, ramulis novellis canescentibus, adultis glabris. Folia breviter petiolata, ovali-elliptica, obtusa v. breviter obtuseque acuminata, 2–4 poll. longa, tenuiter coriacea, glabra, nitida, pennivenia et reticulato-venulosa, et nervis lateralibus utrinque 1–2 e basi oriundis costa media multo tenuioribus brevioribusque percursa. Racemi tomento tenuissimo canescentes, breves, densiflori, in paniculam terminalem foliatam dispositi. Flores nutantes, atropurpurei, primo

intuitu *Fuchsias* mentientes. Pedicelli 2–3 lin. longi. Bracteæ et bracteolæ minutæ, caducæ. Calyx tomento minuto canescens; tubus discifer ad 9 lin. longus, crassiusculus, basi oblique obtusus, apice dilatatus in limbum late campanulatum 3–4 lin. latum abiens; lobi breves, lati. Petala oblongo-lineararia, exserta, stipitata, lamina 3–4 lin. longa. Stamina petalis parum longiora. Ovarium longe stipitatum, oblique acutum. Legumen valde obliquum, oblongum, in speciminibus suppetentibus 2 poll. longum 1 poll. latum, stipite 9 lin. longo, apice basique obtusissimum sed stipiti dorso supra basin affixum et antice infra apicem stylo brevi recto mucronatum.

Hab. West tropical Africa, in bushy palm-grounds near Bango, district of Golungo Alto, in Angola (*Welwitsch*); and if, as is probable, this be the *Schotia simplicifolia*, Vahl in DC. Prod. xi. 508, and Schum. et Thonn. Beskr. Guin. Pl. 212, it was also found by Thonning in the neighbourhood of Christiansberg and in Aguapim on the Guinea coast.

2. *B. TENUIFLORA*, Benth. Foliis obscure trinerviis, racemis glabris, legumine stipite suo subbreuiore antice stylo inflexo mucronato.

Frutex alte scandens, undique glaber. Folia subsessilia, ovali-elliptica v. oblonga, acuminata v. obtusa, 2–4 v. rarius 5 poll. longa, coriacea, nitida, pennivenia, nonnunquam nervis lateralibus prope marginem a basi ortis sed sæpius tenuissimis percursa. Racemi terminales, speciosi, coccinei, densiflori. Calyces pollicares v. paullo longiores, glabri, tubo discifero quam in *B. speciosa* tenuiore, limbo latiore. Petala etiam latiora, 5–6 lin. longa, subsessilia. Legumen 6–9 lin. longum, 4–5 lin. latum, basi subæquale, apice rotundatum, stylo inflexo antice uncinatum, stipite gracili 8–10 lin. longo.

Hab. West tropical Africa, island of Fernando Po (*G. Mann*).

XII. MACROLOBIUM, Schreb.; Benth. et Hook. f. Gen. Pl. 579.

(Tribe AMHERSTIÆ. Tropical America and Africa.)

The two Aubletian genera *Vouapa* and *Outea* had long since been united under Schreber's name *Macrolobium*, adopted by De Candolle; but, at the time of working up Schomburgk's Guiana Leguminosæ for Hooker's 'Journal of Botany' (vol. ii. p. 95), it appeared to me, from the materials we then possessed, that the bifoliolate *Vouapas* might always be distinguished from the pinnate-leaved *Outeas* by the pod, and that both differed from the African *Anthonothas*, in their simple inflorescence at least, if not in the pod also. Now, however, the accession of several American as well as African species shows that these differences are by no means constant: there is considerable diversity in the pods of different species in both the American groups; and one American species, *M. limbatum*, Spruce*, has precisely the inflorescence previously supposed to be characteristic of the African ones. The latter may, however, still be retained as a section, distinguished by the pinnate leaves, larger and less oblique than in most of the American ones, and more or less silky underneath with exceedingly minute hairs, whilst the American are

* *M. limbatum*, foliolis 2 longe oblongis glabris, venis primariis in costam intramarginalem confluentibus, racemis brevissimis secus ramos dense fasciculato-paniculatis, calycis tubo discifero turbinato, petalo summo longe unguiculato, lateralibus 2 minutis, staminodiis 0.—Foliola 6–8-pollicaria v. longiora, petiolo communi brevissimo. Paniculæ ad nodos vetustos 1–1½-pollicares. Flores parvuli, filamentis 3 antheriferis longis gracilibus.—Sandy woods or Caatingas on the Rio Uaupés (*R. Spruce*), n. 2668.

quite glabrous—and by a more coriaceous, usually tomentose or canescent pod, and more prominently marked with obliquely transverse wrinkles.

The following are the three African species known to me:—

1. *M. STIPULACEUM*, foliolis 3–4-jugis oblongis cuspidatis, stipulis maximis foliaceis persistentibus, racemis secus ramos dense fasciculato-paniculatis, calycis tubo discifero parvo campanulato, petalo summo longiuscule unguiculato, lateralibus 4 parvis squamiformibus, staminodiis paucis parvis.

Arbor parva, ramulis petiolis inflorescentiaque pilis minutis appressis tenuiter tomentellis. Foliola sæpe 6–10 poll. longa, jugi infimi minora, utrinque rotundata v. angustata, in acumen angustum $\frac{1}{4}$ – $\frac{1}{2}$ -pollicare producta, supra glabra, subtus tenuiter sericea v. cano-nitentia. Stipulæ lato-lanceolatæ, acutæ, erectæ, rigidulæ, 1–2-pollicares. Paniculæ rameales dense cymiformes, sæpe 2–3 lin. latæ. Flores quam in cæteris speciebus multo majores. Bracteæ subpersistentes, concavæ, 1–2 lin. longæ. Pedicelli semipollicares. Bracteolæ obovatæ, 5–6 lin. longæ, in siccis striatulæ. Calyx glaber, tubo vix lineam excedente; lobi 4, late ovati, obtusi, petaloidei. Petalum superius 4–5 lin. latum, ungue vix 3 lin. excedente; lateralia $\frac{1}{2}$ lin. longa. Stamina 3, longiuscule exserta. Ovarium dense villosum, stipite brevissimo hinc adnato; stylus elongatus, stigmatibus subcapitato. Ovula 6–8. Legumen ignotum.

Hab. West tropical Africa, on the Gaboon river (*G. Mann*).

2. *M. PALISOTI*, foliolis 2–3-jugis obovali-oblongis ellipticisve acuminatis, stipulis obsolete, racemis brevibus laxiusculis secus ramos fasciculato-paniculatis, calycis tubo discifero brevissimo, petalo summo longiuscule unguiculato, lateralibus 2 parvis, additis interdum 2 infimis minutis, staminodiis nonnullis elongatis.

Anthonotha macrophylla, Pal. Beauv. Fl. Ow. et Ben. i. 71, t. 42.

Hab. West tropical Africa. Senegambia (*Heudelot*, n. 793). Fernando Po (*G. Mann*). Confluence of the Quorra and Tchadda (*C. Barter*). District of Golungo Alto (*Welwitsch*).

This appears to have a wide range, and to be somewhat variable in aspect; I had, indeed, at first considered the Fernando-Po specimens to form a distinct species, with the leaves more glabrous underneath and larger; but a further examination convinces me that all the specimens, from the south as well as north of the equator, belong to one species. The staminodia are certainly variable in number and size; and occasionally one or two of the longer ones may become perfect stamens, but much smaller than the three long stamens. The colour of the petals, however, is, according to Mann, yellow: in the Fernando-Po tree they are pink in the figure of the 'Flore d'Oware et de Benin;' but as most of the plates there are coloured after the artist's fancy, this requires further investigation.

3. *M. HEUDELOTII*, Planch. in herb. Hook. sub *Anthonotha*. Foliolis 2–3-jugis ovatis ellipticisve, stipulis obsolete, racemis brevissimis secus ramos elongatos aphyllis racemiformes fasciculatis, petalo summo breviter unguiculato, 2 lateralibus sessilibus summo parum brevioribus, 2 infimis minutis, staminodiis 0 (rarisve).

Frutex elatus, ex Heudelotio 4–5-metralis (12–15-pedalis). Foliola in speciminibus 2–4-pollicaria, breviter acuminata, glabra v. vix subtus minutissime sericea. Paniculæ racemiformes, terminales, pedales et ultra, graciles, minute sericeæ; florum fasciculi parvi, densi, sessiles v. breviter pedunculati. Bracteæ

inconspicuæ. Pedicelli 2-3 lin. longi. Flores quam in *M. macrophylo* minores, ex Heudelotio rubri. Bracteolæ obovatæ, concavæ, $2\frac{1}{2}$ lin. longæ. Calycis tubus brevissimus; lobi petaloidei, bracteolas vix superantes, summo latiore bifido. Petala 3 lata, bifida, calycem subæquantia, intermedio intimo paullo longiore et breviter unguiculato, lateralibus sessilibus latis, 2 infima minute squamiformia, vix $\frac{1}{2}$ lin. longa. Staminodia nulla detexi. Legumen ut in specie præcedente 2-4-pollicare, obliquum, latum, crasse coriaceum, tomentosum v. villosum, oblique rugosum, sutura superiore dilatata utrinque elevato-marginata.

Hab. West tropical Africa. Dry situations in the Fouta Dhiallon in Senegambia (*Heudelot*, n. 738). The very short claw of the upper inner petal is an exception in the genus which was unknown to me when I drew up the character for the 'Genera Plantarum.'

XIII. BERLINIA, Soland.; Benth. et Hook. f. Gen. Pl. 579.

The number of species of this beautiful genus has now been raised by our African collectors to six, of which the following are the diagnostic characters:—

1. *B. BRACTEOSA*, sp. n. Foliolis 3-4-jugis ample obovato-ellipticis oblongisve tenuiter coriaceis, racemis simplicibus densis ante anthesin lupulinis, bracteis amplis imbricatis alabastra obtegentibus, petalis æquilongis omnibus laminatis summo latissimo.

Arbor fide Mannii 40-pedalis, inflorescentia excepta, glabra. Foliola longiuscule petiolulata, 6-8 poll. longa, obtuse acuminata, pennivenia et reticulato-venulosa; stipulæ parvæ. Racemi terminales, supra folia ultima subsessiles, ineunte inflorescentia densi, demum ultrapedales, rhachi bracteis bracteolisque tomento brevissimo incanis sericeisve. Bracteæ ad basin pedicellorum coriaceæ, cuneato-oblongæ, acuminatæ, concavæ fere naviculares, 2-2 $\frac{1}{2}$ poll. longæ, primum imbricatæ alabastra obtegentes, per anthesin caduæ. Pedicelli crassi, 6-9 lin. longi. Bracteolæ ad apicem pedicelli cuneato-oblongæ, 2-2 $\frac{1}{2}$ -pollicares, alabastrum valvatim includentes, per anthesin patentés. Calycis tubus discifer angustus, 6-7 lin. longus, fere glaber; limbi segmenta 5, petaloidea, anguste oblongo-lineararia v. lanccolata, inter se subæqualia, 1 $\frac{1}{2}$ -pollicaria. Petala 5, æquilonga, ungue lato-linearari, lamina suborbiculata v. transverse latiore emarginata margineque crispa; 4 inferiora, inter se similia, ungue fere 2-pollicari, lamina 1-1 $\frac{1}{4}$ poll. lata; summum intimum, ungue brevioré, lamina 2 poll. lata. Stamina 10, longiuscule exserta. Ovarium longiuscule stipitatum, tomentellum, 5-6-ovulatum.

Hab. West tropical Africa. Island of Fernando Po (*G. Mann*).

2. *B. ACUMINATA*, Soland. in Hook. f. Fl. Nigr. 326. Foliolis 3-5-jugis obovali-ellipticis oblongisve tenuiter coriaceis, racemis brevibus subcorymbosis, bracteis parvis caducissimis, petalo summo maximo ungue bracteolas vix superante, inferioribus parvis angustis.

Arbor 40-60-pedalis. Foliola 4-8-pollicaria, acumine vario, sæpius brevi. Flores albi, in speciminibus Mannianis maximi, bracteolis 2-pollicaribus basi longe angustatis, petalo summo 2 $\frac{1}{2}$ poll. lato; in Heudelotianis flores conspicue minores, bracteolis vix 1 $\frac{1}{2}$ poll. longis, petalo summo ut videtur latitudine pollicem paullo excedente; petala inferiora segmentis calycinis breviora v. vix longiora. Stamina 10, longe exserta. Legumen planum, pedale, 2 poll. latum.

Hab. West tropical Africa. Bassa Cove (*Ansell*); Cameroon river (*G. Mann*); Old Calabar river (*G. Mann*, *Rev. W. G. Thomson*); and the smaller variety on the Upper Pongos river, Senegambia (*Heudelot*).

3. *B. AURICULATA*, sp. n. Foliolis 2-3-jugis obovali-oblongis ellipticisve tenuiter coriaceis, racemis brevibus subcorymbosis, bracteis parvis caducissimis, petali summi ungue bracteolis 2-3-plo longiore supra basin auriculato, lamina bifida, inferioribus parvis.

Arbor 20-30-pedalis. Foliola longiuscule petiolulata, fere *B. acuminata*, sed sæpe basi inæquilatera, pleraque 4-6-pollicaria. Stipulæ inconspicuæ. Racemi ad apices ramorum conferti, rhachibus vix tomentellis 1-2-pollicaribus. Pedicelli 4-6 lin. longi. Bracteolæ obovatae, concavae, 8-9 lin. longæ, basi valde contractæ et ima basi diu connatae. Calyx glaber, tubo angusto 3 lin. longo, segmentis linearibus v. lineari-lanceolatis petaloideis 5-6 lin. longis. Petali summi unguis subpollicaris, utrinque supra basin auricula latiuscula obtusa auctus, lamina ad pollicem lata; petala inferiora calycis segmentis breviora, supra basin dilatata, acute acuminata, omnia æqualia v. 2 infima multo minora. Stamina 10, longe exserta. Ovarium brevissime stipitatum.

Hab. West tropical Africa. Cameroon river (*G. Mann*).

4. *B. STIPULACEA*, sp. n. Foliolis 3-5-jugis anguste oblongis rigide coriaceis, stipulis longis rigidis persistentibus, racemis subcorymbosis, bracteis parvis caducissimis, petali summi ungue tenui bracteolis longiore lamina late bifida, inferioribus minimis, staminibus 5.

Arbor 20-30-pedalis, inflorescentia excepta, glabra. Foliola quam in cæteris speciebus angustiora et rigidiora, secus rhachin fere sessilia, 4-5-pollicaria, brevissime acuminata v. calloso-mucronata, pennivenia et reticulato-venulosa, nitidula. Stipulæ rigidae, late lanceolatae, multinerves, sæpius vix poll. longæ. Racemi in paniculam breviter corymbosam dispositi, rhachi 1-2-pollicari cum bracteolis tomento brevi ferruginea. Bractea late ovatae v. orbiculatae, pedicello multo breviores et ante anthesin deciduae. Pedicelli $\frac{1}{2}$ -1-pollicares. Bracteolæ obovato-oblongæ, concavae, pollicares v. paullo longiores, basi quam in præcedentibus minus contractæ. Calycis tubus discifer vix 2 lin. longus, late turbinatus; segmenta angustata, 3-4 lin. longa. Petali summi unguis angustus, inappendiculatus, circa 15 lin. longus, lamina $1\frac{1}{2}$ poll. lata, profunde bifida; petala 4 inferiora minima, linearia. Stamina 5, longe exserta. Ovarium villosum, brevissime stipitatum.

Hab. West tropical Africa. On the river Muni, lat. 1° N. (*G. Mann*).

5. *B. ANGOLENSIS*, Welw., sp. n. Foliolis 3-4-jugis ovalibus v. ovali-oblongis tenuiter coriaceis, racemis subcorymbosis, bracteis parvis caducissimis, petalis subæquilongis, 4 subsessilibus, summo evidentius stipitato, staminibus 10.

Arbor mediocris, inflorescentia excepta, glabra v. foliis novellis tenuiter canescentibus. Foliola in speciminibus 4-8-pollicaria, nunc latiuscula et obtusissima v. retusa, nunc angustiora acuminataque, petiolulo brevi rigidulo; in ramulis sterilibus foliola interdum fide Welwitschii ultrapedalia. Racemi breves, conferti, paniculam corymbosam v. rarius oblongam foliis ultimis multo breviora efficientes, rhachi bracteolisque sericeo-tomentosis. Bractea parva, lata, longe ante anthesin decidua. Pedicelli vix 2 lin. longi. Bracteolæ obovali-oblongæ, concavae, 6-7 lin. longæ, per anthesin patentes. Calycis tubus discifer angustus, 3-4 lin. longus, glaber; limbi segmenta petaloidea, lineari-lanceolata, acutiuscula, 4-5 lin. longa. Petalum summum intimum breviter unguiculatum, ovatum, cucullato-complicatum, 6-7 lin. longum; lateralia 4 sessilia, oblique ovali-oblonga, plana v. vix margine undulata. Stamina 10, longiuscule exserta, filamentis basi glabris pilosulisve. Ovarium villosissimum, stipite brevi; ovula 5-6. Legumen planum, crasso-coriaceum, oblique rugosum, $\frac{3}{4}$ -pedale.

Hab. West tropical Africa. In the woods of Mata do Mangué, and on the river Cuanza, in the province of Pungo Andongo (*Welwitsch*).

The flowers, so much smaller than those of any of the preceding *Berlinias*, would appear to connect this species with *Macrolobium*; but their structure is entirely that of *Berlinia*.

6. *B. PANICULATA*, sp. n. Foliolis 2-4-jugis ovali-oblongis basi inæquilateris coriaceis canescenti-tomentosis glabrativæ, racemis brevibus paniculatis, bracteis parvis caducis, petalis subæquilongis, 4 spathulatis, summo breviter stipitato, staminibus 10 basi diadelphis.

Arbor mediocris, late comosa, 30 pedes attingens, sed jam statu juvenili 5-6 pedes alta frequenter florens. Ramuli foliaque novella tomento brevi molli canescentia, adulta sæpe glabrata. Foliola 2-4-pollinaria, obtusissima v. breviter obtuseque acuminata, rigidule coriacea, petiolulo 1-2 lin. longo, lamina tamen latere inferiore fere ad basin petioluli decurrente. Stipulæ parvæ, latæ, rigidæ. Racemi breves densique, in paniculam ramosam folia superiora sæpe æquantem dispositi, rhachi bracteis bracteolisque fulvo-tomentosis, floribus ex albido flavescentibus. Bracteæ orbiculatæ, concavæ, 1-2 lin. latæ. Pedicelli vix unquam 1 lin. longi. Bracteolæ suborbiculatæ, concavæ, 6-7 lin. longæ, alabastra includentes, per anthesin patentés. Calycis tubus discifer brevissime turbinatus, vix 1 lin. longus; limbi segmenta 5, rigidule petaloidea, margine ciliata, obovali-oblonga, 2-3 lin. longa. Petala 4 inferiora spathulata, 4-5 lin. longa, lamina 1-2 lin. lata, 2 infima lateralibus paullo minora; quintum summum interius breviter unguiculatum, late ovato-suborbiculatum, concavum, cæteris paullo brevius. Stamina 10, longiuscule exserta, 9 inferiora basi in vaginam fere 2 lin. longam connata, decimum summum a basi liberum. Ovarium brevissime stipitatum, breve, villosissimum, ovulis 4-5; stylus elongatus, glaber, involutus, stigmatè peltato. Legumen oblongum, valde obliquum, 2-3 poll. longum, 1-1½ poll. latum, junius dense tomentosum, demum glabratum, læve nec rugosum.

Hab. West tropical Africa. Angola district, forming with other Leguminous trees considerable woods in the district of Huilla, and, judging from a specimen in fruit only, also in Pungo Andongo (*Welwitsch*).

This species, in its small flowers, short calyx-tube, and reduced petals, forms some approach to the genus *Brachystegia*, and differs from that, as well as from the true *Berlinias*, in the stamens diadelphous at the base; but this character does not appear to be of sufficient importance for its separation from the latter genus, with which it is closely connected through *B. angolensis*.

Var. ? *ferruginea*, foliis molliter fulvo-villosis. Rare near Mumpulla in the Huilla district (*Welwitsch*).

The specimen is in fruit only, but appears to differ from the normal form only in the indumentum.

XIV. BRACHYSTEGIA, Benth. in Benth. et Hook. f. Gen. Pl. 582.

(Tribe AMHERSTIÆ. Tropical Africa.)

CHAR. GEN. Calycis tubus discifer brevissimus v. subnullus; limbi segmenta 2-5, parva, petaloidea v. minute squamiformia. Petala 0 vel rarius 1-2 minutissima. Stamina 10, subdeclinata, basi breviter connata v. sublibera, filamentis elongatis; antheræ ovato-oblongæ, loculis longitudinaliter dehiscentibus. Ovarium stipitatum v. subsessile, liberum, breve, ∞-ovulatum; stylus elongatus, stigmatè terminali truncato v. dilatato. Legumen oblongum v. lato-lineare, obliquum v. falcatum, compressum, coriaceum v. sublignosum, 2-valve, sutura superiore incrassata. Semina pauca, transversa, ovata vel orbiculata, compressa; albumen 0; cotyledones planæ, carnosulæ, radícula brevi recta inclusa.—Arbores cortice fibroso. Folia abrupte pinnata, foliolis haud amplis sæpius obliquis. Flores parvuli, in racemos breves densos nunc simplices spiciformes, nunc plurimos paniculatos dispositi. Bracteæ caducissimæ; bracteolæ obovato-orbiculatæ, concavæ, alabastrum bivalvatim includentes calycemque mentientes, per anthesin patentés.

The above character is slightly modified from that which we had given in the 'Genera Plantarum,' the additional species received from Dr. Welwitsch since the sheet was printed off having enabled me more correctly to understand the structure of the flowers. The calyx-like outer envelope is in fact, as we had doubtfully suggested, a pair of bracteoles like those of *Macrolobium* and *Berlinia*; the very small scale-like bodies described as petals are shown by the *B. tamarindoides*, in which they are more developed, to be calyx-segments, like those of *Berlinia*, five in number when complete, but some often deficient; and the petals appear to be entirely wanting, or reduced to one or two quite microscopic. The genus may be considered, therefore, to be much more closely allied to *Berlinia* than we had supposed, chiefly in the very much reduced floral envelopes.

Of this genus we have now the three following species:—

1. *B. TAMARINDOIDES*, Welw. Foliolis 10–20-jugis oblique oblongo-lanceolatis obtusis sessilibus basi valde inæquilateris, racemis brevibus densis paniculatis, pedicellis brevissimis, ovario subsessili.

Arbor ex Welwitschio 20–40-pedalis, habitu et imprimis foliorum figura et compositione *Tamarindo indicæ* simillima. Ramuli et folia novella tomentoso-puberula, adulta glabrata. Foliola arcte sessilia, conferta, 6–9 lin. longa, obtusa, basi latere interiore angusta, exteriori rotundata, coriacea, 2–3-nervia, costa media parum excentrica. Inflorescentia fulvo-tomentosa; racemuli fere in spicas parvas oblongas v. subglobosas conferti, in paniculam oblongam folia summa non excedentem dispositi. Bracteæ ovatae, concavae, 1–1½ lin. longæ, caduæ. Pedicelli vix ulli. Bracteæ ovali-orbiculatae, concavae, 2½ lin. longæ. Calycis segmenta 5, squamiformia, ciliata, vix lineam longa. Petala 0 vel rarius 1–2, minuta, linearia. Stamina 10, bracteolis paullo longiora, basi in anulum brevissime connata. Ovarium subsessile, villosum, 6–8-ovulatum. Stylus glabratus, stigmatibus truncato. Legumen valde obliquum, in stipite brevissimo angulo recto inflexum, 2–3 poll. longum, planum, crasso-coriaceum, læve, sutura superiore incrassato-dilatata.

Hab. West tropical Africa. In the Huilla district of Angola, forming here and there small woods between Lopollo and Lake Toantâla (*Welwitsch*).

Dr. Welwitsch has also specimens of two trees which, if not varieties, appear to be closely allied to the preceding,—one, in leaf and fruit, with the leaflets of the same number and shape as in *B. tamarindoides*, but nearly twice as large, and not crowded, and the pod larger and not so smooth. This was gathered by Welwitsch between Condo and Guisonde, and at Sansamanda in Pungo Andongo. A single leaf of a tree from the mountains of Zanguebar in Speke and Grant's collection belongs probably to the same species or variety. The other is more evidently distinct, but is in leaf only: the leaflets are more numerous, intermediate in size between those of the two others, and the midrib is very near to the upper margin. It forms a low shrub of 1 to 2½ feet, common in the Mutollo woods between Pedras de Guinga and Candumba in the district of Pungo Andongo.

2. *B. SPICÆFORMIS*. Foliolis 4–6-jugis ovatis vel ovali-oblongis obtusis basi obliquis brevissime petiolulatis, racemis brevibus simplicibus dense spiciformibus, pedicellis brevissimis, ovario breviter stipitato.

Arbor gracilis, 10–20-pedalis, ramulis foliisque novellis pube brevi plus minus vestitis demum glabriusculis. Foliola per paria dissita, 1–1½ vel rarius 2 poll. longa, basi oblique rotundata, tenuiter coriacea, pennivenia, costa parum excentrica, petiolulo brevissimo at distincto. Stipulae lineares,

membranaceæ, caducissimæ. Spicæ fulvo-pubescentes, novellæ cylindricæ bracteis alabastrisque imbricatis, per anthesin oblongæ, rhachi demum 1-1½-pollicari. Bracteæ, orbiculatæ, concavæ, 2 lin. longæ, caducissimæ. Pedicelli vix ulli. Bracteolæ obovato-orbiculatæ, concavæ, 3-4 lin. longæ, per anthesin patentis. Calycis segmenta squamiformia 1-5, sæpius 2, inæqualia, oblonga v. linearia, rarissime lineam excedentia. Petala sæpius 0, rarissime adsunt 1-2 minuta. Stamina 10, breviter exserta, basi in cupulam brevem irregulariter connata. Ovarium breviter stipitatum, dense villosum, ovulis ad 6; stylus glaber, stigmatibus truncato. Legumen 3-4 poll. longum, 1¼-1½ poll. latum, coriaco-sublignosum, læve, sutura superiore incrassato-dilatata.

Hab. Tropical Africa. In woods of the Huilla district of Angola, rather frequent between Mumpulla and Nene, and between Morino and Lake Tvantala (*Welwitsch*).

Var. *parviflora*. Bracteoles scarcely 3 lines long, but every other character precisely as in the western specimens. Robeho mountains, in Zanguebar, at an elevation of 4700 feet (*Speke and Grant*, who observe that the bark is made into kilts, cloths, band-boxes, huge grain-stores, mats, roofing for camp-huts, &c., and that a blood-red juice exudes on cutting the bark).

Var. (?) *grandiflora*. Bracteoles rather above 4 lines long, and flowers not quite so sessile, but otherwise the same. Summits of the Sierra da Hella in the Huilla district, at an elevation of 4000 feet, with flowers and young leaves at the ends of the branches, otherwise nearly leafless (*Welwitsch*).

3. **B. APPENDICULATA.** (Plate XLII.) Foliolis 3-6-jugis ovali-oblongis lanceolatisve vix coriaceis glabris breviter petiolatis, racemis confertis subramosis, pedicellis bracteolis subæquilongis, ovario longe stipitato.

Arbor 20-40-pedalis, inflorescentia excepta, glabra; foliola secus petiolum tenuem per paria dissita, 1-2-pollicaria, acuminata v. obtusa, obliqua, falcata v. basi inæquilatera v. rarius subæqualia, multo tenuiora quam in speciebus præcedentibus, pennivenia et venulosa. Stipulas non vidi. Glandulæ parvæ vesiciformes ad basin foliolorum sæpe stipellas mentientes. Racemi dense multiflori, oblongi, breviter pedunculati, 1-2-pollicares, solitarii simplicesque v. basi ramo uno alterove instructi. Bracteæ minimæ, lineares, caducissimæ. Pedicelli graciles, ad 3 lin. longi. Bracteolæ 2-2½ lin. longæ, late obovatæ, concavæ, extus tomentellæ, per anthesin patentis. Calycis segmenta squamiformia sæpius 2-3. Petala nulla invenimus. Stamina 10, bracteolis dimidio longiora, filamentis gracilibus basi breviter connatis; antheræ glandula minuta apiculatæ. Ovarium longiuscule stipitatum, breve, margine ciliatum, ovulis 5-6. Legumen 3-4 poll. longum, 1¼-1½ poll. latum, sutura superiore incrassato-dilatata.

Hab. East tropical Africa. Highlands of the Batoka Country and about Zomba, on Lake Shirwa, the fibrous bark one of those used for cloth by being beaten out, and the seeds eaten (*Kirk*).

XV. BAIKIÆA, Benth. in Benth. et Hook. f. Gen. Pl. 581.

(Tribe AMHERSTIÆ. Tropical Africa.)

CHAR. GEN. Calycis tubus discifer turbinatus; segmenta 4, longa, crassa, marginibus abrupte attenuatis anguste imbricatis. Petala 5, unguiculata, obovato-spathulata, subæquilatera, summo intimo subæquilatero, cæteris obliquis. Stamina 10, summo libero, cæteris basi connatis, filamentis alternis basi villosis, alternis tenuioribus glabris; antheræ lineares, versatiles. Ovarium dense villosissimum, ∞-ovulatum, stipite calycis tubo hinc adnato; stylus glaber, elongatus, stigmatibus parvo. Legumen . . .—Arbores, floribus exceptis, glabræ. Folia abrupte pinnata, foliolis 1-2-jugis coriaceis. Flores maximi, in racemos brevissimos subterminales conferti. Bracteæ et bracteolæ breves, caducæ.

As the flowers of *Camoënsia maxima* are the largest known among Papilionaceæ, so are those of *Baikia insignis* the largest among Cæsalpinieæ, and said to be as grand-looking as those of *Camoënsia*. Its characters also, although showing some affinity to *Schotia*, are at the same time so well marked, that there is little danger of the genus being merged into any other. I have therefore great pleasure in dedicating it to the distinguished and enterprising traveller who, during his noble and persevering exertions in the cause of West-tropical-African civilization, has also done so much towards making us acquainted with the botanical treasures of that country, and whose loss every friend of Africa has so much reason to deplore.

The only species known may be thus described :—

B. INSIGNIS, sp. n. (Plate XLI.)

Arbor, teste Mannio, 30-40-pedalis, inflorescentia excepta, glabra. Foliola nunc semipedalia late ovali-elliptica, nunc oblonga 4-5-pollicaria, obtusa v. obtuse acuminata, rigide coriacea, nitida, venis præter costam validam parum conspicuis, petiolulata, secus petiolum brevem opposita v. alterna. Stipulæ parvæ, ovatæ, squamiformes. Flores maximi, nutantes, pauci ad apices ramorum conferti racemum brevissimum constituentes, rhachi bracteis calycibusque dense fusco-velutinis. Bracteæ et bracteolæ latæ, concavæ, 1-2 lin. longæ. Pedicelli brevissimi, crassi. Calycis tubus crassus, turbinatus, fere 9 lin. longus; segmenta linearia, demum 3 poll. longa, crassa, dorso fusco-velutina, intus sericeo-villosa, ad margines angustissime attenuata, per anthesin revoluta et mox decidua. Petala semipedalia, obovata, basi in unguem longe angustata, dorso laxè villosa, intus medio pilosula, marginibus utrinque glabris; summum intimum, cæteris latius at non longius. Stamina 5 petalis fere æquilonga, 5 alterna triente breviora, filamentis basi villosis superne sparse pilosis glabratissve. Ovarium villosissimum, in stipitem longiusculum attenuatum, ovulis ad 8; stylus superne glaber, stigmate capitato.

Hab. West tropical Africa. Island of Fernando Po (*G. Mann*). Some fragments sent from Ango by Consul *Burton* may possibly belong to the same species.

XVI. CRUDIA, Schreb.; Benth. et Hook. f. Gen. Pl. 584.

This genus, hitherto supposed to be exclusively American, had not been recognized in the Old-World species published, which have, consequently, been referred to other genera. The three I am acquainted with are the following :—

1. *C. SENEGALENSIS*, Planch. in herb. Hook. MS. Glabra, foliolis 5-7 ovatis oblongisve acuminatis basi valde obliquis, stipulis maximis foliaceis persistentibus, racemis laxis pedunculatis.

Frutex elatus v. arbor parva, *C. Parivoæ*, DC., stipulis exceptis, simillima. Foliola 3-4-pollicaria. Stipulæ ovato-lanceolatae, acutæ, membranaceæ, persistentes, $\frac{3}{4}$ -1 poll. longæ. Racemi 4-5-pollicares. Pedicelli graciles, dissiti. Flores omnino *C. Parivoæ*.

Hab. West tropical Africa. On the Nunez river, Senegambia (*Heudelot*, n. 708). On the Nun river and in the island of Fernando Po (*G. Mann*).

2. *C. ZEYLANICA*. Glabra, foliolis 2-6 ovatis oblongisve acuminatis basi parum obliquis, stipulis obsoletis, racemis floribundis parce pilosulis folio æquilongis brevioribusve.

Detarium zeylanicum, Thwaites, Enum. Ceyl. Pl. 414.

Arbor ingens; folia fere *C. Parivoæ*. Flores multo minores, pedicellis brevibus.

Hab. Galpatta, near Cultura, Ceylon (*Thwaites*, n. 3714).

3. *C. BANTAMENSIS*. Foliolis 1-3 ample oblongis v. obovali-oblongis obtusis coriaceis glabris, racemis densifloris puberulis folia excedentibus.

Pryona bantamensis, Miq. Fl. Ind. Bat. i. pars 1. 1081.

Touchiroa bantamensis, Hassk. Retzia, i. 202.

Arbor. Foliola 4-8-pollicaria, petiolo communi brevi. Racemi sæpe ultrapedales, fere a basi floribundi, pedicellis brevissimis.

Hab. Bantam province, in Java (*Hasskart*).

XVII. CRYPTOSEPALUM, Benth. in Benth. et Hook. f. Gen. Pl. 584.

(Tribe CYNOMETRÆ. Tropical Africa.)

CHAR. GEN. Calycis tubus discifer brevissimus; segmenta 4, minuta, squamiformia. Petalum 1, sessile, orbiculatum. Stamina 3, filamentis brevibus; antheræ oblongæ, versatiles, loculis longitudinaliter dehiscentibus. Ovarium breviter stipitatum, liberum, 2-ovulatum; stylus filiformis, stigmate terminali truncato. Legumen—Arbuscula. Folia abrupte pinnata. Flores parvi, in racemos breves axillares dispositi. Bracteæ ad basin racemi junioris squamiformes, imbricatæ, mox deciduæ; bracteolæ majusculæ, concavæ, valvatæ, alabastrum includentes.

This genus is founded on a small African tree which Hooker, in the 'Niger Flora,' had from imperfect specimens, referred doubtfully to *Cynometra*, of which it has the inflorescence. We have now, however, excellent flowering specimens which show a structure much more nearly allied to that of *Copaifera*, but differing in several essential points which appear to justify the raising it into a genus distinct from both *Cynometra* and *Copaifera*. The buds, closed before flowering, and opening into concave valves, are as in *Brachystegia*; but the presence of a rudimentary calyx inside shows, without doubt, that the outer covering must be referred to bracteoles. The stamens, which in *Cynometra* have the complete number of ten, and in *Copaifera* have only occasionally one or two of the ten deficient, are here reduced to three; and the petals, five in *Cynometra*, and none in *Copaifera*, are here reduced to one small one. The pod is unknown, but the ovary is entirely that of the *Cynometræ*.

The following is the only species known:—

C. TETRAPHYLLUM. (Plate XLIII. B.)

Cynometra? tetraphyllum, Hook. f. Fl. Nigr. 329.

Arbuscula glabra v. inflorescentia parce puberula. Gemmæ squamis imbricatis mox deciduis stipatæ.

Foliola sæpissime bijuga, oblique ovata, subfalcata, valde inæquilatera, obtusa vel obtuse acuminata, tenuiter venosa, jugi superioris 1-1½ vel in ramulis sterilibus 2 poll. longa, jugi inferioris dimidio breviora, petiolo communi brevi tenui. Flores parvi, roseo-albi, numerosi, in racemulos axillares foliis breviores dispositi. Bracteæ lanceolatæ, membranaceæ, longe ante anthesin deciduæ. Pedicelli graciles, 2-3 lin. longi. Bracteolæ in speciminibus vix 1½ lin. longæ, florem omnino includentes. Calycis tubus vix ¼ lin. longus, lobis adhuc brevioribus. Petalum ½ lin. longum, suborbiculatum. Genitalia bracteolis breviora. Flores tamen vix perfecte evoluti.

Hab. West tropical Africa. Sugar-loaf Mountain, Sierra Leone (*G. Don, Barter*). Although the flowers

of Barter's specimens are none of them quite expanded, yet they have every appearance of having attained their full size, the lower ones of the racemes being often partially open, whilst those from still lower down have already fallen away.

XVIII. COPAIFERA, Linn.; Benth. et Hook. f. Gen. Pl. 585.

Two African trees have been published as new genera, which I should be inclined to reduce to *Copaifera*: they differ strikingly from the majority of the American species in their leaves reduced to a single pair of leaflets; but we have one Cuban species, *C. hymenæifolia*, Moric., in which that is the case, besides the doubtful n. 3150 of Blanchet from Brazil, which may not be a congener, being only known in unripe fruit. One of these African genera, *Guibourtia* of Bennett, has every character of *Copaifera*, except that the bracteoles are persistent and about one-fourth the length of the calyx, whilst in all the other species they are very deciduous and often very minute: but I have never found the persistence and size of bracteoles a good generic character, excepting when they valvately enclose the bud, forming as it were an outer calyx. The other genus, *Gorskia* of Bolle, has a thinner pod than other *Copaifera*; but in the American species the pod is variable in thickness and quite flat in some, very convex in others; and this, again, appears to me to be a specific, not a generic distinction. A third tropical-African species of true *Copaifera* has the foliage, minute bracteoles, and flat pod of the West-Indian *C. hymenæifolia*; but the seed is almost totally enveloped in a scarlet arillus, which, in the Cuban species, is thick, obliquely truncate, and under the seed, scarcely embracing its base. To these three I provisionally add the widely spread Ironwood tree of Dr. Kirk, which, on account of its remarkable seed with corrugated cotyledons and numerous immersed resinous vesicles, he had proposed as a distinct genus under the name of *Colophospermum*. I have also since received it from Dr. Welwitsch, who had also proposed it as a new genus. Unfortunately the flowers have not been detected by either of these travellers, and there is nothing in the foliage or pod to distinguish it from the thin-podded *Copaiferas* except the cotyledons; and the corrugated cotyledons observed in *Macrolobium acaciæfolium*, Benth., and not in the other species of the same genus the nearest allied to it, show that that is not to be regarded as a generic character, unless accompanied by floral differences. We must therefore wait till we have seen the flowers to determine whether *Colophospermum* of Kirk is to be adopted as a genus or to merge into *Copaifera*.

The bifoliolate species of *Copaifera* known to me may be thus distinguished:—

1. *C. HYMENÆIFOLIA*, Moric. Pl. Nouv. Amér. i. t. 1. Foliolis unijugis falcato-ovatis acuminatis penniveniis coriaceis nitidis, floribus pedicellatis, legumine plano coriaceo, arillo crasso sub semine oblique truncato.

Hab. Cuba (*Ramon de la Sagra*); near Monte Verde in eastern Cuba (*Wright*, n. 1189).

2. *C. COLEOSPERMA*, sp. n.? Foliolis unijugis falcato-ovatis acuminatis penniveniis coriaceis nitidis, floribus pedicellatis, legumine plano coriaceo, arillo coccineo semen involvente.

Hab. East tropical Africa. Highlands of the Batoka country, where it forms a large tree, in some parts

planted at least a hundred years ago. The aril, which is red, is used for making a drink, said to be very nourishing, and to have saved the people in the time of famine (*J. Kirk*).

The specimens are in fruit only, but the persistent pedicels show that the inflorescence was the same as that of *C. hymenæifolia*, the foliage and pods are precisely the same, and the doubt occurs whether the difference in the aril is constant, and whether the species are really distinct? If they are identical, how is their coexistence in two such distant countries to be explained? Can the seeds have been carried out to Cuba by the negro slaves? The precise station in Cuba is not given by Ramon de la Sagra; that given by Wright is near a town or settlement.

3. *C. GORSKIANA*. Foliolis unijugis late falcato-ovatis obtusissimis vel vix acuminatis 3-4-nerviis penniveniis reticulatis coriaceis, floribus subsessilibus, bracteolis minutis caducissimis, legumine plano tenui reticulato, seminibus exarillatis, cotyledonibus planis.

Gorskia conjugata, Bolle, in Peters, Mossamb. Bot. i. 16, f. 3.

Legumen stipitatum, planum, oblique ovato-orbiculatum, reticulato-venosum, ad $1\frac{1}{2}$ poll. longum, 1 poll. latum, juxta styli vestigium breviter angusteque coriaceo-alatum. Semen compressum, ovali-orbiculatum, hilo laterali; cotyledones carnosulæ, planæ, radícula juxta hilum recta, intra cotyledonum emaginaturam retracta.

Hab. East tropical Africa. Near Sena and Tetté (*Peters*); near Tetté, a tree of considerable size, supplying good timber (*Kirk*).

4. *C. GUIBOURTIANA*. Foliolis unijugis obovato-falcatis obtuse acuminatis 3-5-nerviis penniveniis reticulatis coriaceis, floribus sessilibus, bracteolis persistentibus calycis quartam partem attingentibus, legumine

Guibourtia copallifera, Benn. in Journ. Linn. Soc. i. 150.

Flores quam in cæteris speciebus majores.

Hab. West tropical Africa. Near Goderich and Lumley in Sierra Leone, known as the Kobo-tree (*W. K. Daniell*).

- 5? *C.?* (COLOPHOSPERMUM) MOPANE, *Kirk*, sp. n. (Plate XLIII. A.). Foliolis unijugis falcato-semiovatis obtusis v. obtuse acuminatis 7-9-nerviis reticulatis, (floribus pedicellatis?) legumine plano tenuiter coriaceo obscure reticulato, seminibus exarillatis vesiculis resiniferis faretis, cotyledonibus corrugatis.

Arbor speciosa, habitu *Bauhiniarum*, ligno præstantissimo, resina sanguinea (*Kirk et Welwitsch*), tota glaberrima. Folia fere *Hardwickiæ binatæ*; foliola valde obliqua, fere semicordata, $1\frac{1}{2}$ - $2\frac{1}{2}$ poll. longa, $\frac{3}{4}$ -1 poll. lata, arcte sessilia, ad apicem petioli $\frac{1}{2}$ - $\frac{3}{4}$ -pollicaris acumine parvo subfoliaceo terminati. Flores desunt. Legumina ad axillas racemosa, rhachi foliis sæpius breviora, pedicellis 1-3 lin. longis. Legumen vix stipitatum, oblique obovato-falcatum, $1\frac{1}{2}$ -2 poll. longum, fere pollicem latum, stylo laterali, sutura superiore brevi angusta, inferiore angustissime 1-alata. Semen magnum, reniforme, testa tenui, hilo laterali; cotyledones insigniter corrugatæ, vesiculis resinosis semiimmersis conspersæ.

Hab. Tropical Africa. Shiramba and Lupata Mountains on the Zambesi (*Kirk*); forming large forests in the rocky hills round the base of the Serra da Xella, near Bumbo in Angola (*Welwitsch*). Collected by both travellers in 1860, but first received from Dr. Kirk.

XIX. CYNOMETRA, Linn.; Benth. et Hook. f. Gen. Pl. 586.

The species now more or less known of this genus are numerous, dispersed over the tropical regions of the New as well as the Old World, and require a careful revision to determine their limits. The following two new ones however, peculiar to Africa, are so distinct in aspect, in their petal-like bracteoles, and in some points of structure, that I have proposed to establish for them a distinct section, under the name of *Hymenostegia*, thus characterized:—

Bracteolæ membranaceæ, petaloideæ, persistentes. Calycis tubus discifer turbinatus. Petala 2 infima minuta. Ovarii stipes tubo calycino hinc adnatus.

The pod is unknown, except from an old detached valve in Welwitsch's collection, which indicates that it is much larger and of a thinner consistence than in the other species.

1. *C. FLORIBUNDA*, sp. n. Foliolis 4-jugis oblique trapezoideis, racemis laxis floribundis, bracteolis ovatis cordatisve petaloideis, petalis 2 infimis minutis.

Arbor 30-pedalis. Folia adulta glabra, petiolo communi $1\frac{1}{2}$ –2-pollicari; foliola sessilia, obtusiuscula, jugi ultimi 1– $1\frac{1}{2}$ poll. longa, inferiora minora, coriacea, basi apiceque valde inæquilatera, costa subtus prominente, tenuissime pennivenia. Stipulæ inconspicuæ. Racemi in axillis summis, 2–3-pollicares, paniculam efficiunt pulchram foliatam, rhachi hirtella a basi florifera. Pedicelli 3–4 lin. longi. Bracteolæ infra apicem pedicelli patentés, obtusæ, 3-lin. v. paullo longiores. Calyx glaberrimus; tubus late turbinatus, $1\frac{1}{2}$ lin. longus; limbi segmenta 4, lata, subpetaloidea, per anthesin reflexa, summo latiore. Petala 2 lateralia obovato-oblonga, in unguem angustata, erecta, 3–4 lin. longa; summum intimum, paullo minus et angustius; 2 infima minuta, linearia. Stamina 10, libera, 5 petala superantia, 5 alterna breviora. Ovarium villosissimum, stipite brevi calycis tubo hinc breviter adnato; stylus elongatus, glaber, stigmatē vix dilatato.

Hab. West tropical Africa. On the River Mani, lat. 1° N. (*G. Mann*).

2. *C. LAXIFLORA*, sp. n. Foliolis 1–2-jugis falcato-ovatis acuminatis, racemis longis paucifloris, bracteolis ovato-subcordatis petaloideis, petalis 2 infimis minutis.

Arbor 25–35-pedalis et altior, glabra. Foliola pleraque unijuga, 2–4-pollicaria, basi valde obliqua, per anthesin membranacea, demum coriacea, nitidula, costa prominente, tenuiter pennivenia, addito nonnunquam pari inferiore foliorum multo minorum. Racemi terminales, simplices, pauciflori. Pedicelli graciles, 4–5 lin. longi. Bracteolæ omnino *C. floribundæ*, nisi paullo majores, et florum structura eadem in alabastro apparet, perfecte evolutos non vidi.

Hab. West tropical Africa. District of Golungo Alto (*Welwitsch*).

DESCRIPTION OF THE PLATES.

PLATE XXXIII.

- A. *Microcharis tenella*; natural size. Fig. 1. Flower. 2. Standard. 3. One of the wings. 4. Keel. 5. Stamens. 6. Anther. 7. Calyx and pistil. 8. Pod. 9. Seed. All much enlarged.
 B. *Microcharis latifolia*.

PLATE XXXIV.

- Mastersia Assamica*. Fig. 1. Bud. 2. Flower, with the bracteoles. 3. One of the bracteoles. 4. Standard. 5. One of the wings. 6. Keel. 7. Stamens. 8. Pistil: all somewhat enlarged. 9. Portion of one of the valves of the pod, on the inside, showing the seeds; natural size. 10. Seed, enlarged. 11. Seed cut open, showing the embryo; much enlarged. 12, 13. Embryo. 14. Diagram of the flower, including the bracteoles.

PLATE XXXV.

- Panurea longifolia*. Fig. 1. Flower. 2. Calyx. 3. Standard. 4. One of the wings. 5. One of the keel-petals. 6. Stamens. 7. Anther. 8. Pistil. 9. The same, with the ovary cut open. All much enlarged.

PLATE XXXVI.

- Camoënsia maxima*. Fig. 1. Calyx cut open, showing the stamens and insertion of the stipes of the ovary. 2. Pod. 3. Seed. 4. Embryo. 5. The same, cut open, showing the radicle.

PLATE XXXVII.

- Batesia floribunda*. Fig. 1. Bud. 2. Flower expanded. 3. Two of the petals. 4. Stamens and pistil. 5. Two of the stamens. 6. Pistil. 7. Ovary cut open: all somewhat enlarged. 8. Pod. 9. The same, as open when ripe; and 10. Seed: natural size. 11. Seed somewhat enlarged, and cut open, showing the embryo. 12, 13. Embryo. 14. Diagram of the flower without the bracteoles.

PLATE XXXVIII.

- Dicymbe corymbosa*. Fig. 1. Flower, with the bracteoles removed. 2. One of the bracteoles. 3. One of the sepals, from outside. 4. The same, from inside. 5. One of the petals, from outside. 6. The same, from inside. 7. Two of the stamens. 8. Pistil. 9. Ovary, cut open: all slightly enlarged. 10. Diagram of the flower, including the bracteoles.

PLATE XXXIX.

- Oligostemon pictus*, Benth. Fig. 1. Bud, showing the first and second sepals. 2. Third sepal. 3. Fourth sepal. 4. One of the three upper petals. 5. One of the two lower petals. 6. Stamens. 7. The treble upper stamen, from outside. 8. Pistil: all more or less enlarged. 9. Young pod; natural size.

PLATE XLI.

Bandeiræa speciosa, Welw. Fig. 1. Flower. 2. Calyx, cut open, showing the stamen and insertion of the pistil. 3. One of the petals. 4. Two of the stamens. 5. Ovary, cut open: all more or less enlarged. 6. Pod; natural size. 7. Seed. 8. Seed cut open, showing the embryo. 9. Embryo.

PLATE XLII.

Baikiea insignis, Benth. Fig. 1. Stamens. 2. Anther. 3. Ovary cut open. 4. Diagram of the flower.

PLATE XLIII.

Brachystegia appendiculata, Benth. Fig. 1. Bud, enclosed in the bracteoles. 2. Flower, expanded. 3. One of the calyx-segments or sepals. 4. Ovary, cut open: all much enlarged. 5. Pod; natural size. 6. Seed. 7. Transverse section of the same. 8. Embryo. 9. One of the cotyledons and radicle. 10. Leaflet, with the stipella-like glands.

PLATE XLIV.

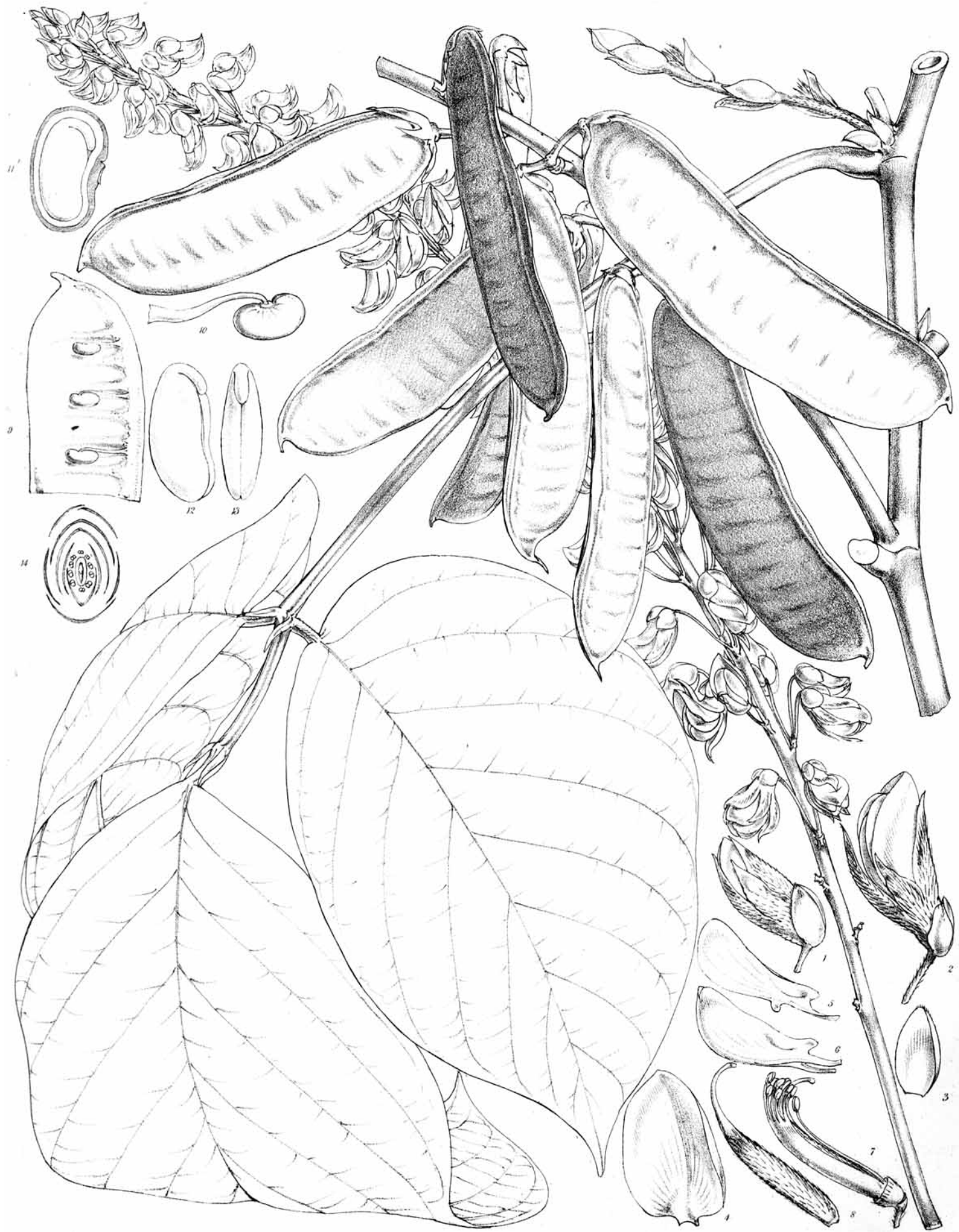
A. *Copaifera Mopane*, Kirk. Fig. 1. Pod, cut open, showing the seed. 2. Seed, cut open, showing a section of the testa, one cotyledon, and the radicle. 3. Transverse section of the seed.
 B. *Cryptosepalum tetraphyllum*, Benth. Fig. 1. Bud. 2. Flower, with one of the bracteoles. 3. Petal. 4. Two of the stamens. 5. Calyx and pistil. 6. Ovary, cut open. All much enlarged.



W. Fitch del.

Day & Son, (Limited) Lith. London.

A. *Microcharis tenella*, Benth. B. *M. latifolia*, Benth.



tch. del et lith.

Mastersia Assamica. Benth.

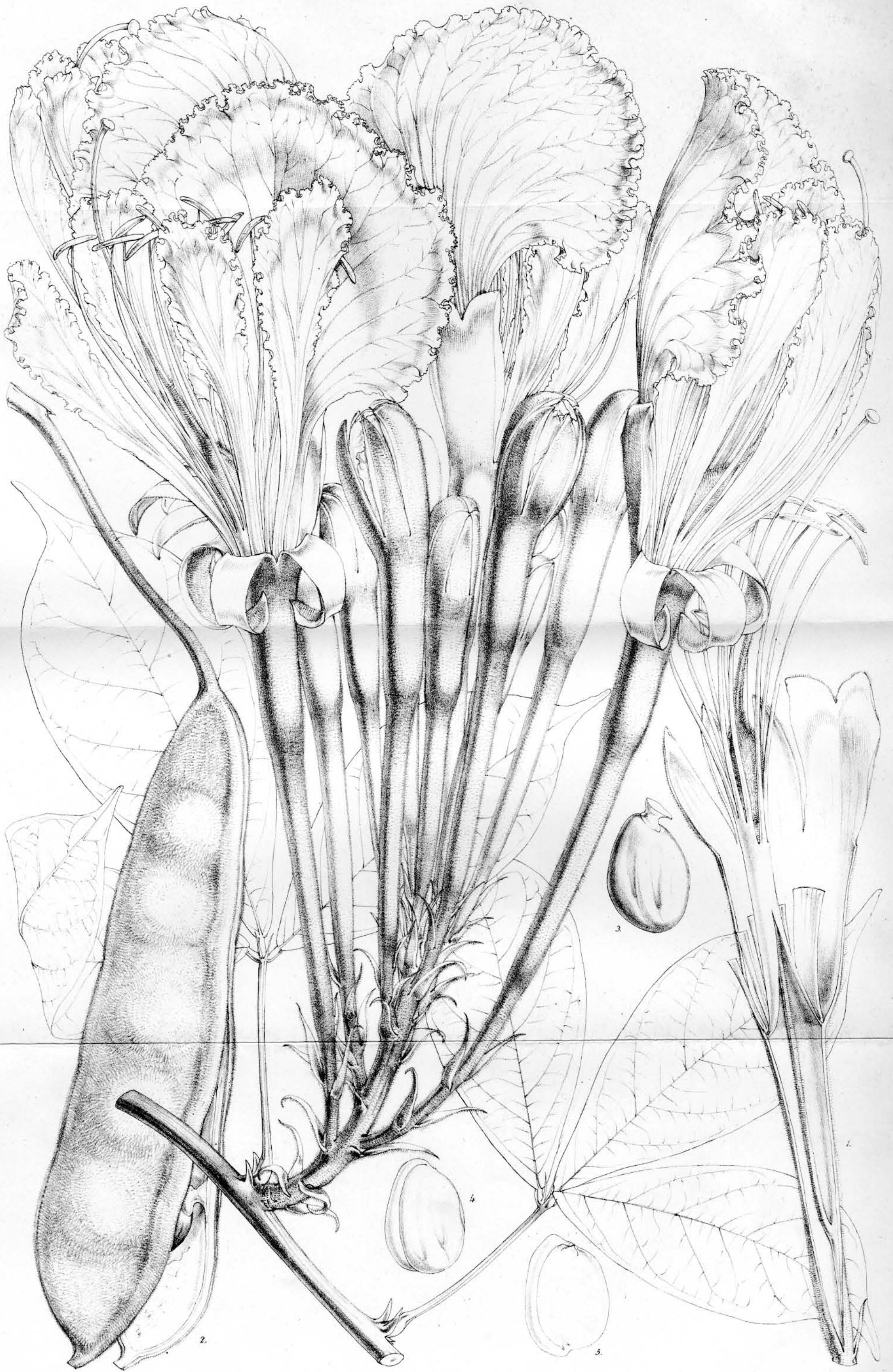
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Day & Sons (limited) Lith London

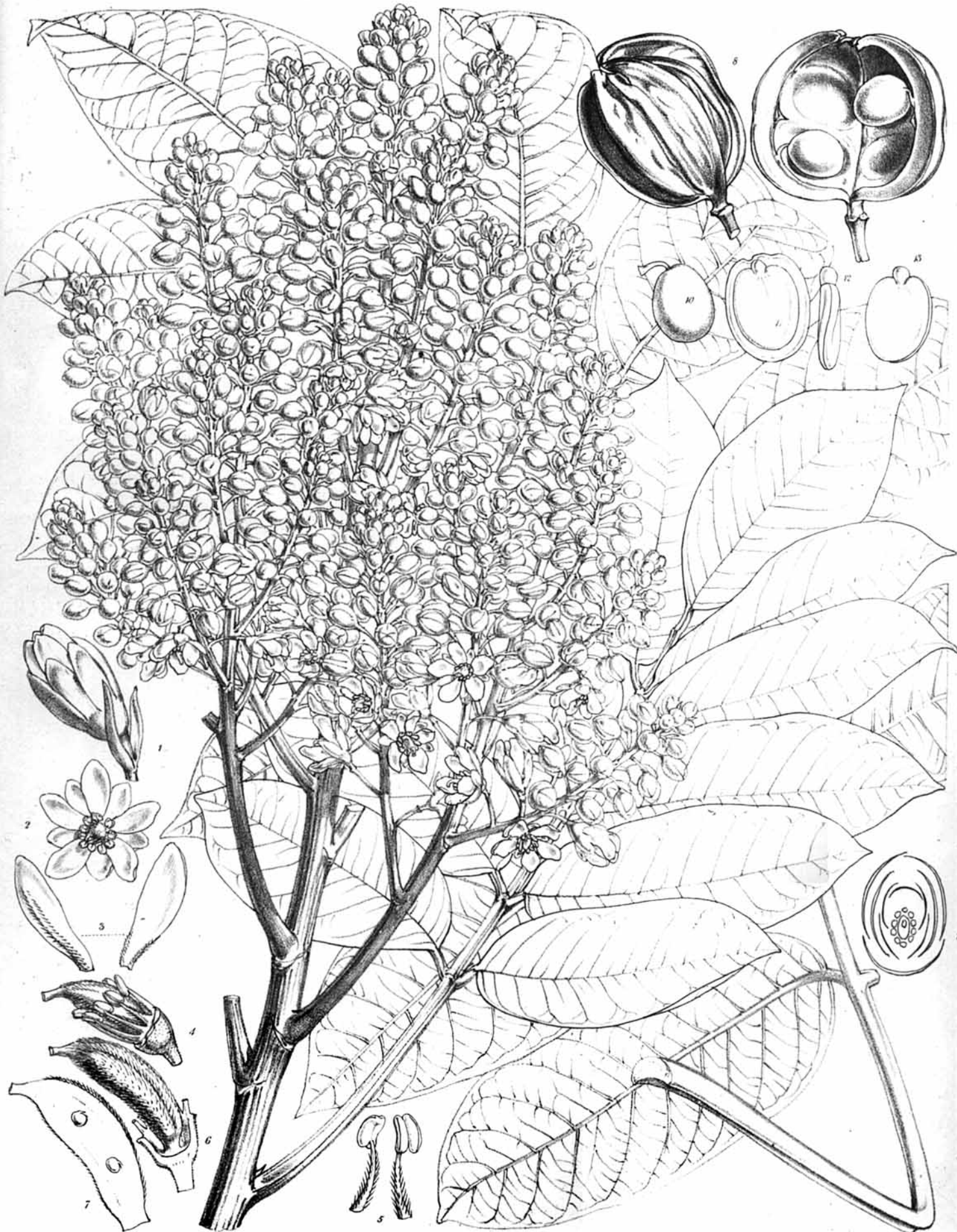
Panurea longifolia, Spruce.



Fisch, del. et lith.

Vincent Brooks, imp.

Camoënsia maxima, Welw.



W. Hitch. del et lith.

Day & Son (limited) Lith. London.

Batesia floribunda. Spruce



W Fitch del et lith

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Dicymbe corymbosa, Spruce.



Fuchs del. et lith.

Vincent. Brooks, Imp.

Oligostemon pictum, Benth.



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Bandeirea speciosa, Welw.



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Dry & Scott (limited) Lith, London

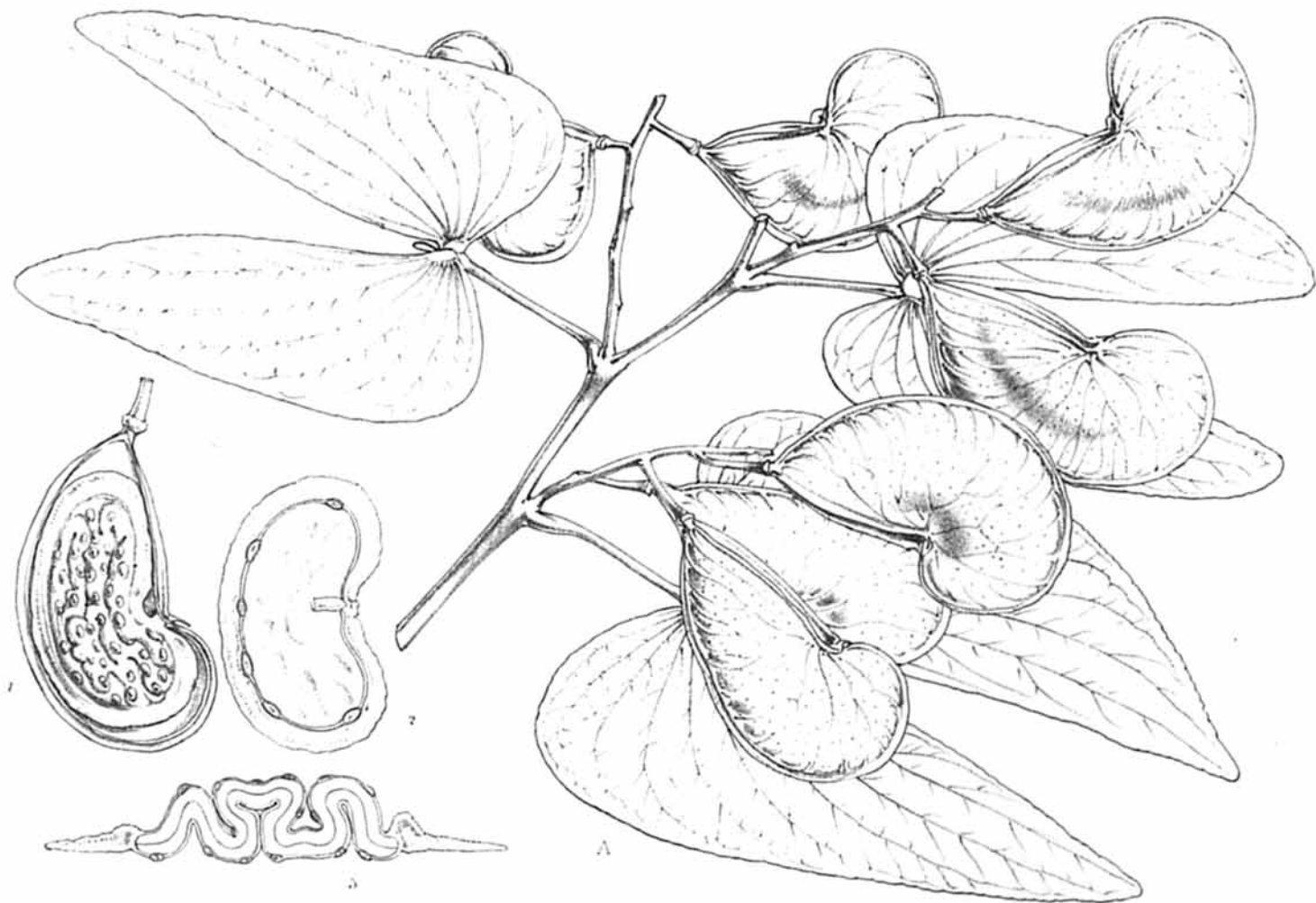
Barkiaea insignis, Benth.



h. del et lith

Day & Son, Limited Lith London

Brachystegia appendiculata Benth.



W. E. Fisher del. et lith.

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A. *Coposifera mopane*, Kirk. B. *Cryptosepalum tetraphyllum* Benth.